

# WHAT IS THE ASSOCIATION BETWEEN AAA HERNIAS AND SIMPLE RENAL CYSTS

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# INTRODUCTION

- Aortic aneurysms, abdominal wall hernias and simple renal cysts (SRCs) are degenerative conditions that share a number of epidemiologic features.
- Incisional hernia is a well-known complication of laparotomy, occurring in 7% to 26% of patients.
- Several small-scale retrospective studies and a few prospective studies have suggested that patients undergoing surgery for abdominal aortic aneurysm (AAA) have a higher risk of inguinal and of developing a postoperative incisional hernia than patients undergoing surgery for aorto-iliac occlusive disease (AIOD)

# SIMPLE RENAL CYSTS

- Simple renal cysts (SRCs) are benign, acquired lesions, comprising a disease entity different from hereditary polycystic kidney disease.
- Connective tissue repair impairment has been implicated in their development
- At least 3 studies have shown increased incidence of SRCs in AAA patients when compared to patients with AIOD or trauma suggesting a common pathogenesis

Pitoulas G, et al. *World J Surg* (2012) 36:1953–1957

Yaghoubian A, et al. *Ann Vasc Surg* (2006) 20:787–791

Gindera LB, et al. *Minerva Chirurgica* (2015) 70:409-16

Hall KA, et al. Am J Surg 1995;170:572-76

**Retrospective Single Institution Study**  
**195 consecutive patients with aortic surgery**  
**All had midline incisions**

**128 with AAAs**

41 (32%) Abdominal Wall Hernias  $p < 0.05$   
13 (10%) Ventral Incisional Hernias  $p < 0.05$   
28 (22%) Inguinal Hernias  $p = \text{NS}$   
36 (28%) Recurrent AWHs  $p < 0.01$

**65 with AIOD**

13 (19%)  
2 (3%)  
11 (17%)  
12 (19%)

Henriksen NA, et al. J Vasc Surg 2013;57:1524-30.

Retrospective Analysis of Prospectively collected data in

- The Danish Vascular Registry
- The Danish Hernia Repair Registry

Study population : **2597 patients** underwent aortic surgery

**838 AIOD**

and

**1759 AAA**

Median follow-up 28.9 months (range, 0-71.6 months)

The cumulative risk of incisional hernia repair was 11% for AAA patients, leading to a **1.6-fold higher risk of incisional hernia repair** for AAA patients compared with AIOD patients after adjustment for age, ASA score, and BMI.

Hall KA, et al. Am J Surg 1995;170:572-76

Henriksen NA, et al. J Vasc Surg 2013;57:1524-30

The incidence of VIH was considerably lower than that reported by others

**11% - 42% (AAA) versus 2% - 12% (AIOD)**

# INGUINAL HERNIAS

Hall KA, et al. Am J Surg 1995;170:572-76

The incidence of inguinal hernias (IHs) was not significantly different in the AAA and AIOD patients

Cannon DJ, et al. Arch Surg 1984;119:387-389.

A greater number of IHs (**26% versus 15%**) in patients with AAA.

Variability relates to type of study and use of clinical diagnosis vs. surgical repair for calculation of hernia incidence

Rafetto JD J Vasc Surg 2003;37:1150-4

**Prospective Multi Institution Study**

**259 patients who had aortic surgery in 3 institutions**

**All patients examined for hernias at least 6 months after index procedure**

**177 with AAAs**

**82 with AIOD**

68 (38.4%)	Abdominal Wall Hernias p=0.001	9 (11%)
50 (28.2%)	Ventral Incisional Hernias p=0.002	9 (11%)
42 (23.7%)	Inguinal Hernias p=0.003	5 (6.1%)

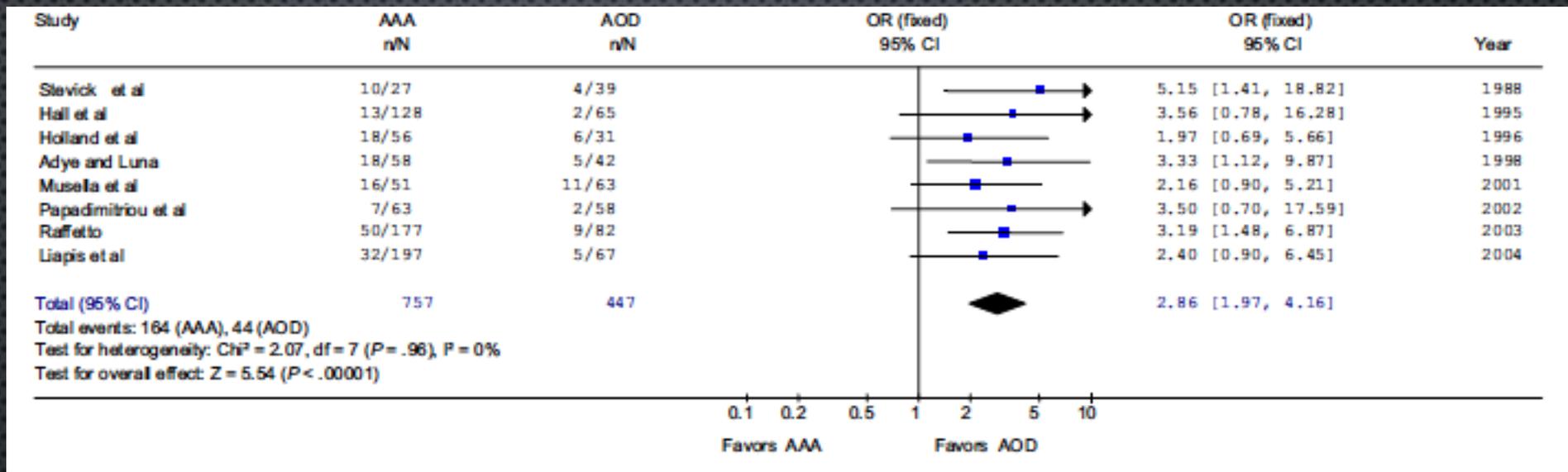
Adjusting for age, smoking, COPD, BMI, diabetes, bowel obstruction, and suture type, **patients with AAA had almost a 9-fold risk for postoperative incision hernia formation** (odds ratio: 8.8, P =0049).

# Antoniou, et al, et al. Am J Surg 1995;170:572-76

## Pooled analysis of available publications

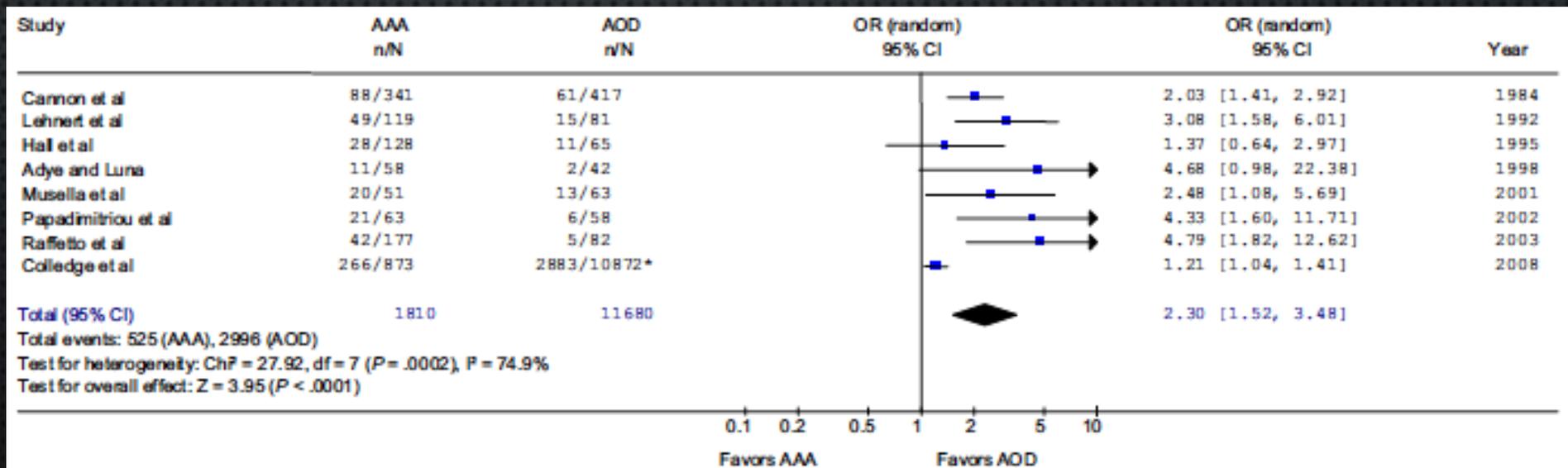
### Ventral Incisional Hernias

OR: 2.86;  
95% CI 1.97-4.16;  
P < .00001



### Inguinal Hernias

OR: 2.30;  
95% CI 1.52-3.48;  
P < .0001



# PATHOPHYSIOLOGY

- Dysregulation in connective tissue metabolism, specifically defects in collagen synthesis and degradation have been reported in patients with IHs and AAA.
- An increase in proteolytic activity in AAA patients who smoke compared to those with AIOD has been demonstrated, and the hypothesis is that this increase in proteolytic activity may contribute to the greater frequency of IHs in patients with AAA.

Cannon DJ, et al. Arch Surg 1984;119:387-389.

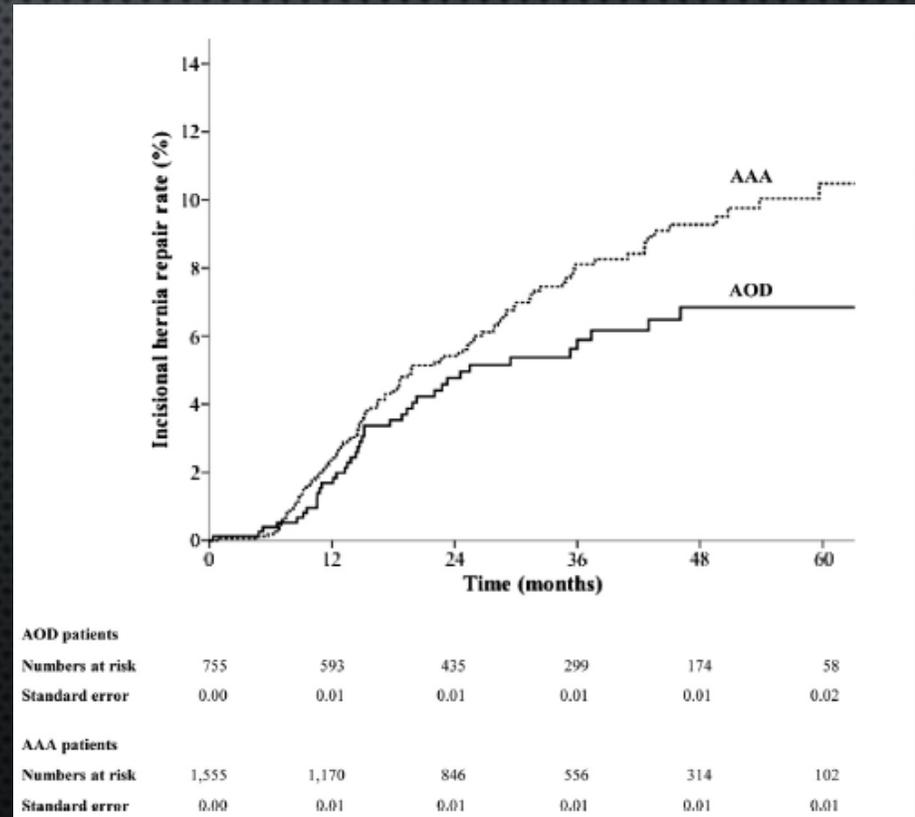
- Although an abnormal connective tissue remodeling process is suspected, no common pathway for the two conditions has been identified
- Several biomarkers have been suggested as markers for aneurysm growth, however, none of these are useful for both aneurysm and hernia disease

Henriksen NA, et al. J Vasc Surg 2013;57:1524-30.

Retrospective Analysis of Prospectively collected data in

- The Danish Vascular Registry
- The Danish Hernia Repair Registry

For the first 2 years after surgery for AOD or AAA, the cumulative risks of incisional hernia repair were nearly the same, possibly suggesting that early hernias arose because of technical failures or wound dehiscence



## CLINICAL SIGNIFICANCE

Male patients with inguinal hernia have a fourfold increased prevalence of AAAs compared with control subjects without hernias

There is no evidence to support a benefit from screening elderly patients with inguinal hernias for AAAs

Antoniou GA, et al. J Vasc Surg 2011;53:1184-8.

## CLINICAL SIGNIFICANCE

- Two recent randomized controlled trials evaluated the use of prophylactic mesh insertion vs. sutured fascial closure with nonabsorbable suture in patients undergoing open elective AAA repair
- The incisional hernia rate was significantly decreased in the mesh group, with no increase in the wound infection rate in both studies

Bevis PM, et al. Randomized clinical trial of mesh versus sutured wound closure after open abdominal aortic aneurysm surgery. *Br J Surg* 2010;97:1497-502.

Muysoms FE, et al. Prevention of Incisional Hernias by Prophylactic Mesh augmented Reinforcement of Midline Laparotomies for Abdominal Aortic Aneurysm Treatment *Ann Surg* 2016;263:638–645



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THANK YOU

