

# Sensitivity of subcutaneous abdominal fat tissue aspirates in cardiac amyloidosis



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# ■ Background



Background

Purpose

Methods

Methods (2)

Results

Conclusions

Recommendations

# Background



Van Gameren et al.,  
*Arthritis Rheum* 2006

Fine et al.,  
*Am J Cardiol* 2014

Quarta et al.,  
*Eur Heart J* 2017

## Sensitivity

AA	92%		
AL	94%		84%
ATTRv		67%	45%
ATTRwt		14%	15%

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# Purpose

To evaluate the sensitivity of routinely performed fat tissue aspirates in patients with **cardiac amyloidosis** at our centre



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# Methods

248 cardiac amyloidosis patients (2012 through 2020)

- 100 AL
- 82 ATTR<sub>v</sub>
- 66 ATTR<sub>wt</sub>

Cardiac involvement:

1. Endomyocardial biopsy
2. Echocardiography or CMR
  - Left ( $\geq 12$  mm) and/or right ( $\geq 7$  mm) ventricular wall thickness
  - Histological presence and type of amyloid elsewhere
3. Positive bone scintigraphy (Gillmore et al., *Circulation* 2016)

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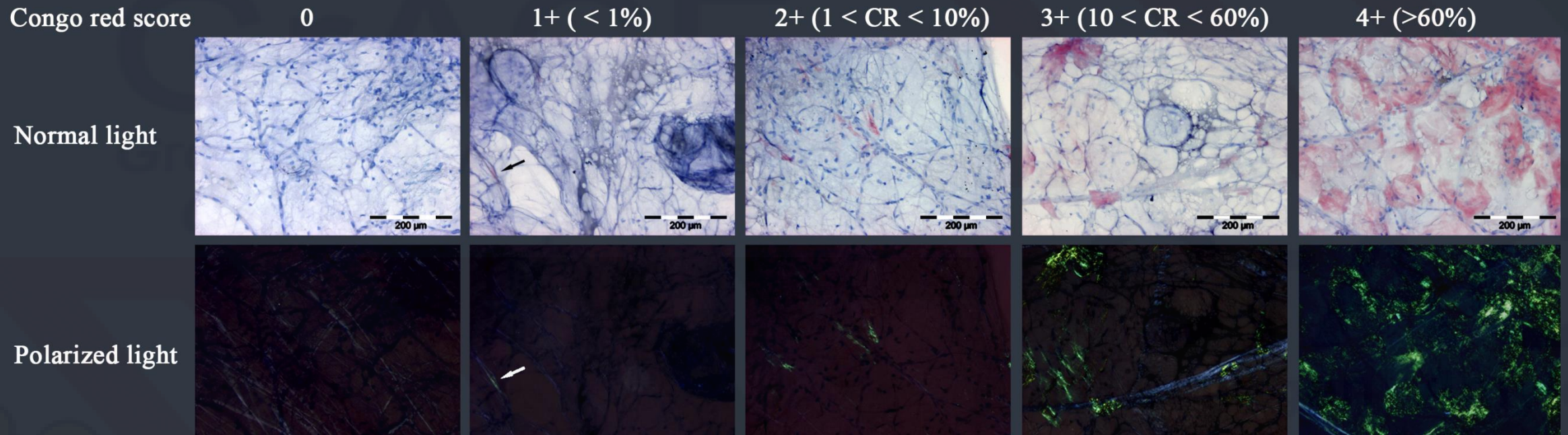
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# Methods (2)

Fat tissue aspirates taken at the first visit (time of diagnosis), stained with Congo Red



Hazenberg et al., *Amyloid* 2007

Three smears

Two double-blinded, experienced observers

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# Results (1)

	Total	Control	AL	ATTRv	ATTRwt
<i>n</i>	248		100	82	66
Age, years (SD)	66 (11)		66 (9)	60 (12)	73 (6)
Sex, <i>n</i> (%)	181 (73)		61 (61)	58 (71)	62 (94)
Semi-quantitative score, <i>n</i> (%)					
0	30 (12)		1 (1)	7 (9)	22 (33)
1+	49 (20)		7 (7)	13 (16)	29 (44)
2+	30 (12)		13 (13)	12 (15)	5 (7)
3+	62 (25)		28 (28)	25 (30)	9 (14)
4+	77 (31)		51 (51)	25 (30)	1 (2)
Positive biopsy, <i>n</i> (%)	218 (89)		99 (99)	75 (91)	44 (67)

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## Results (2)

	Total	Control	AL	ATTRv	ATTRwt
<i>n</i>	248		100	82	66
Age, years (SD)	66 (11)		66 (9)	60 (12)	73 (6)
Sex, <i>n</i> (%)	181 (73)		61 (61)	58 (71)	62 (94)
Semi-quantitative score, <i>n</i> (%)					
0/1+	79 (32)		8 (8)	20 (25)	51 (77)
2+	30 (12)		13 (13)	12 (15)	5 (7)
3+	62 (25)		28 (28)	25 (30)	9 (14)
4+	77 (31)		51 (51)	25 (30)	1 (2)
Positive biopsy, <i>n</i> (%)	169 (68)		92 (92)	62 (75)	15 (23)

Fine et al. 14%  
Quarta et al. 15%

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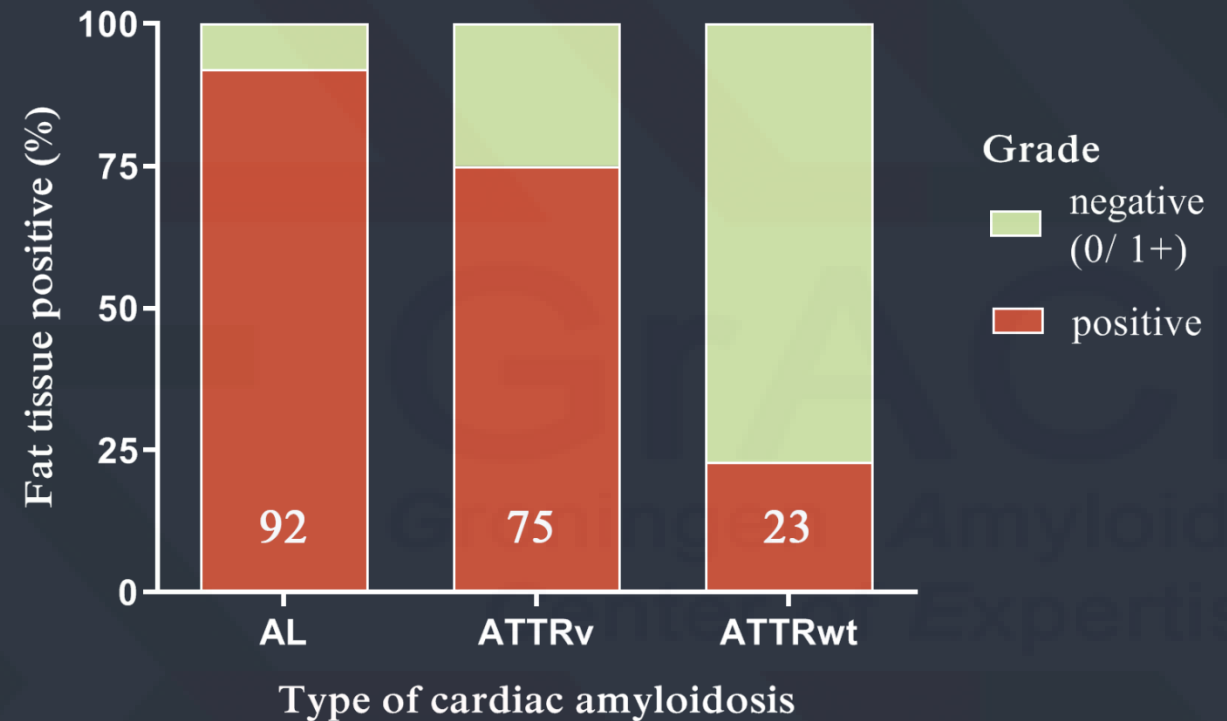
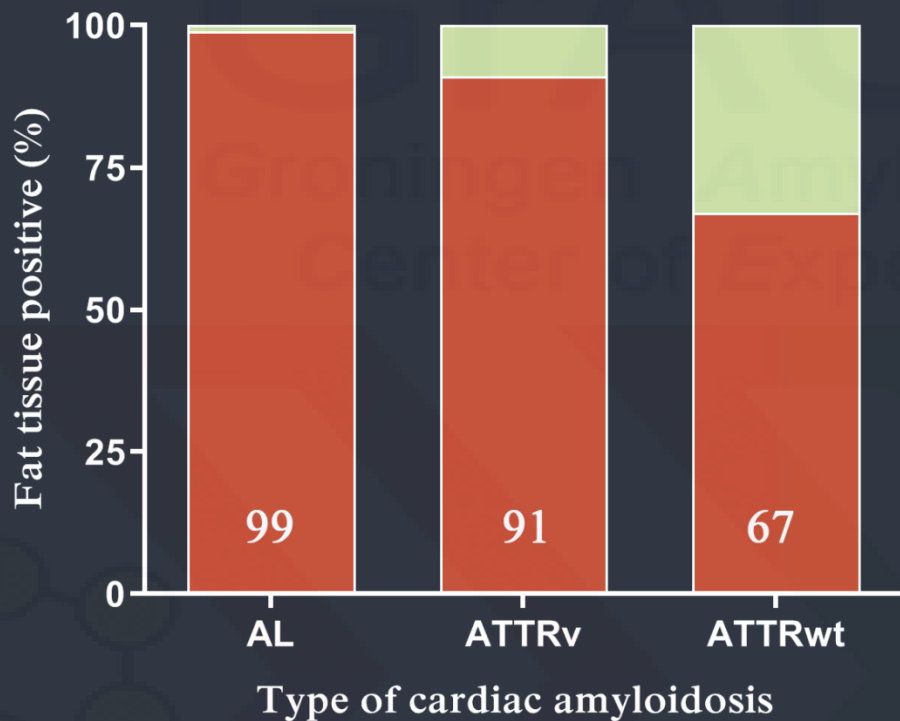
Conclusions

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## Results (3)

Semi-quantitative amount of amyloid in fat tissue



# Conclusions

Abdominal subcutaneous fat tissue aspiration has

- good sensitivity in cardiac **AL** and **ATTRv** amyloidosis
- 67% (!) sensitivity in **ATTRwt**

*Plausible* explanation for the 67%:

By considering fat smears scored 1+ negative

- We approximated sensitivities as reported by Fine et al. (*Am J Cardiol* 2014) & Quarta et al. (*Eur Heart J* 2017)



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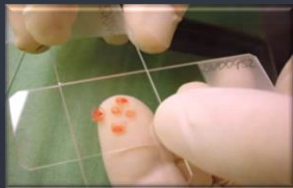
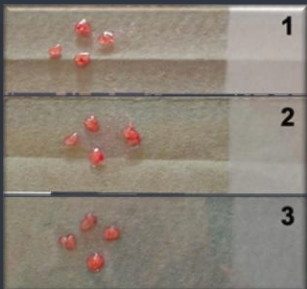
Recommendations

# Recommendations

- Aspirate biopsy



- **Three** slides with enough material



Good microscope  
High power (100 W)  
Bright objectives

Stain **three** slides with Congo Red and score

Take your time (5 min per slide)

Constantly switch between **normal** and **polarised** light

**Two** double-blinded, experienced observers

■ *Thank you for your attention*



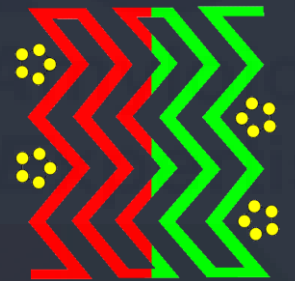
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