



UniversitätsKlinikum Heidelberg

**Eröffnungssymposium des Amyloidosezentrums Heidelberg
02.05.09**

Amyloid: Der fokussierte Blick

Die Sicht des Pathologen

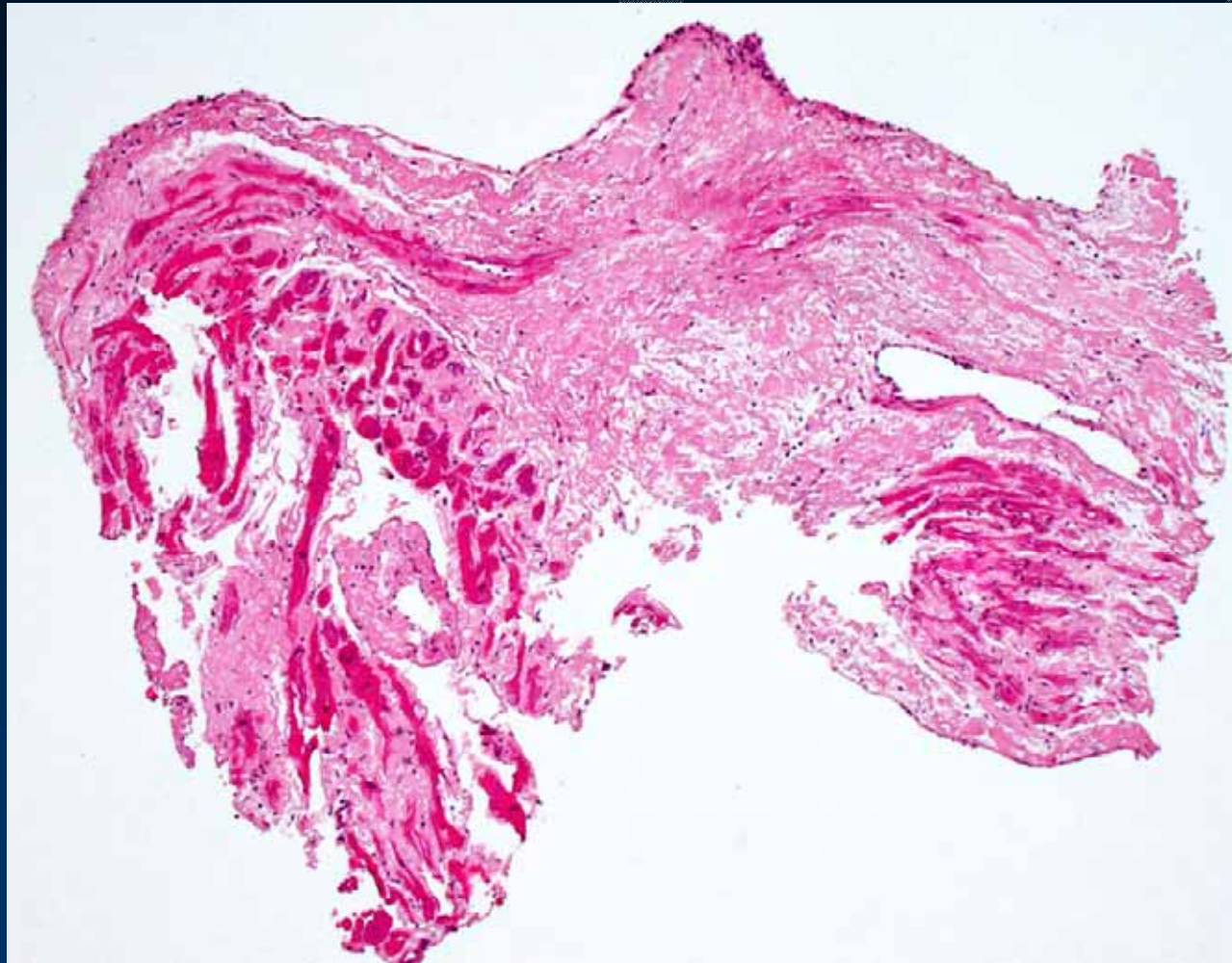
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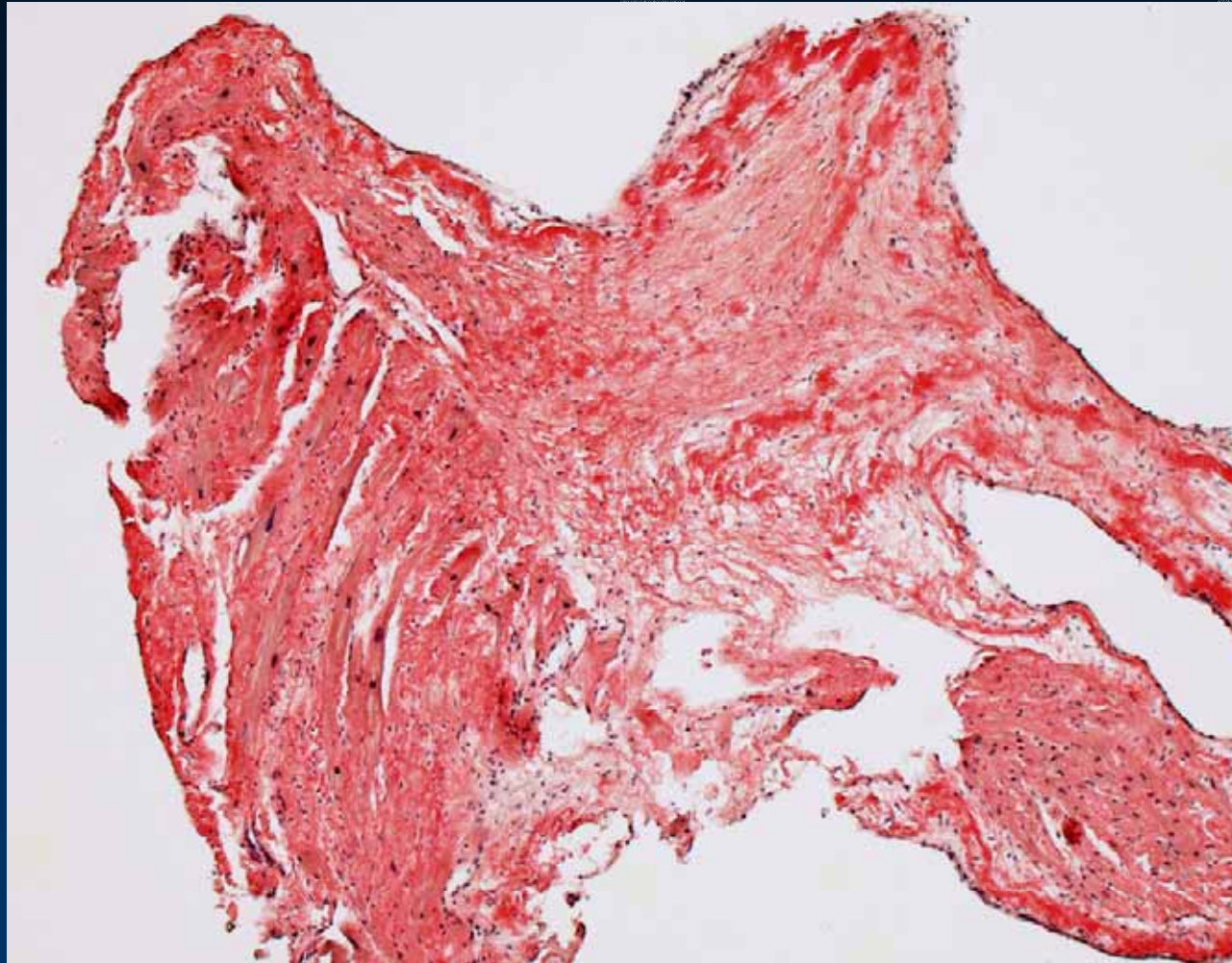
- **Distribution patterns of amyloid in the myocardium**
- **Findings in endomyocardial biopsies**
- **Findings in explanted hearts**
- **Pathophysiology**
- **Work in progress**
- **Virtual microscopy**

Subendocardial distribution

E-28681/02 A2; HE (5x)



Subendocardial distribution E-28681/02 A3; Kongo red (5x)



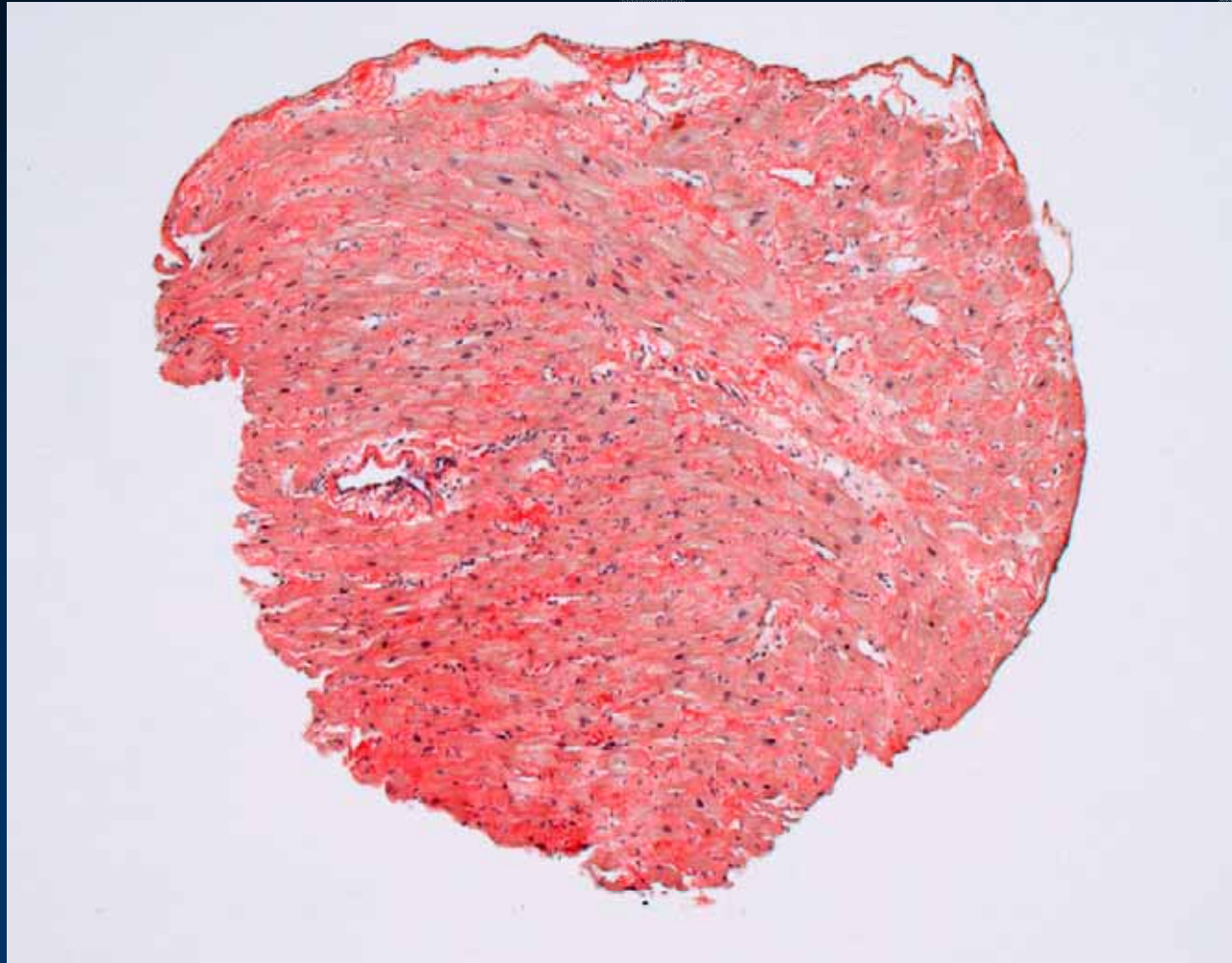
Endomysial distribution

E-28681/02 A; HE (5x)

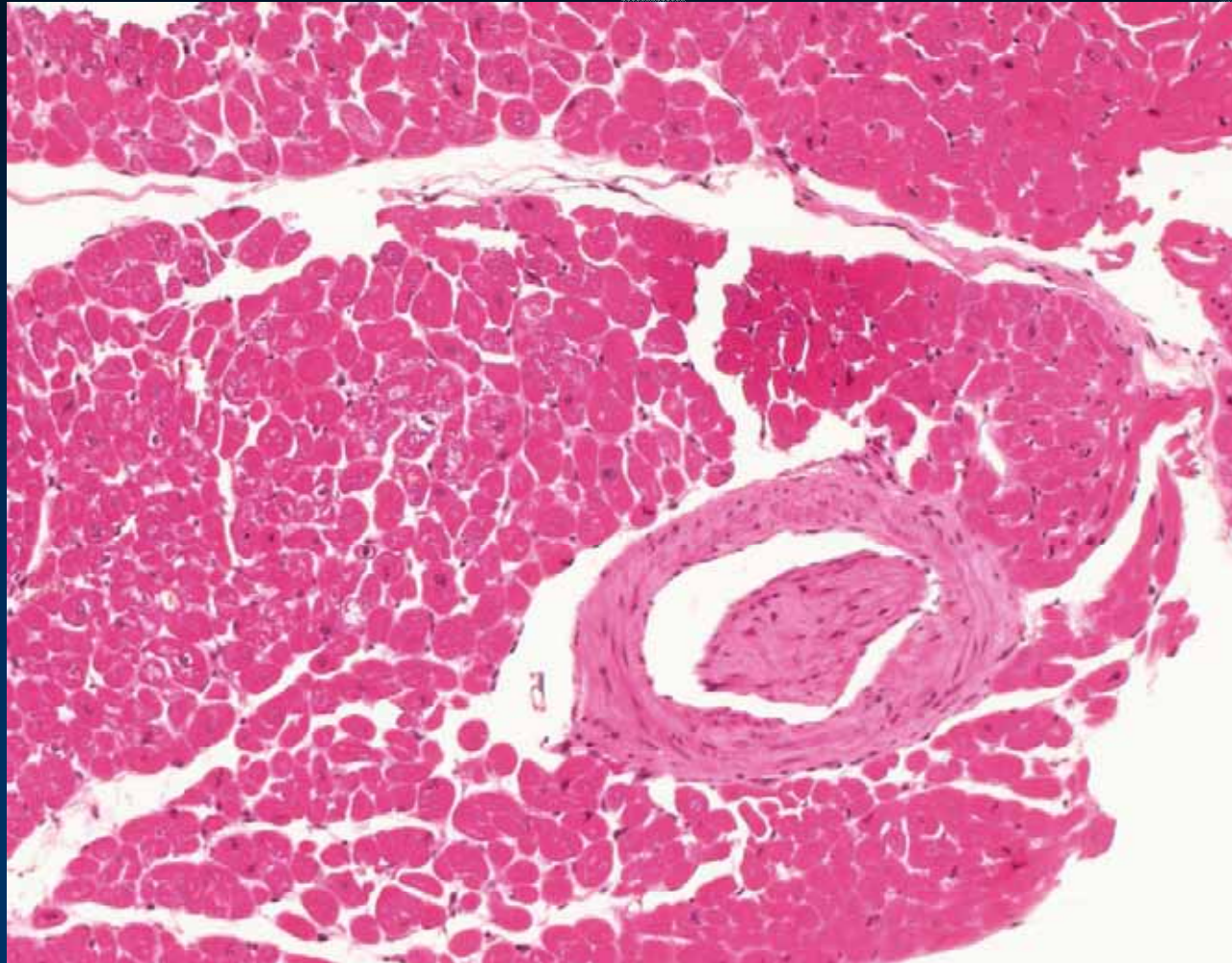


Endomysial distribution

E-28681/02 A1; Kongo red (5x)



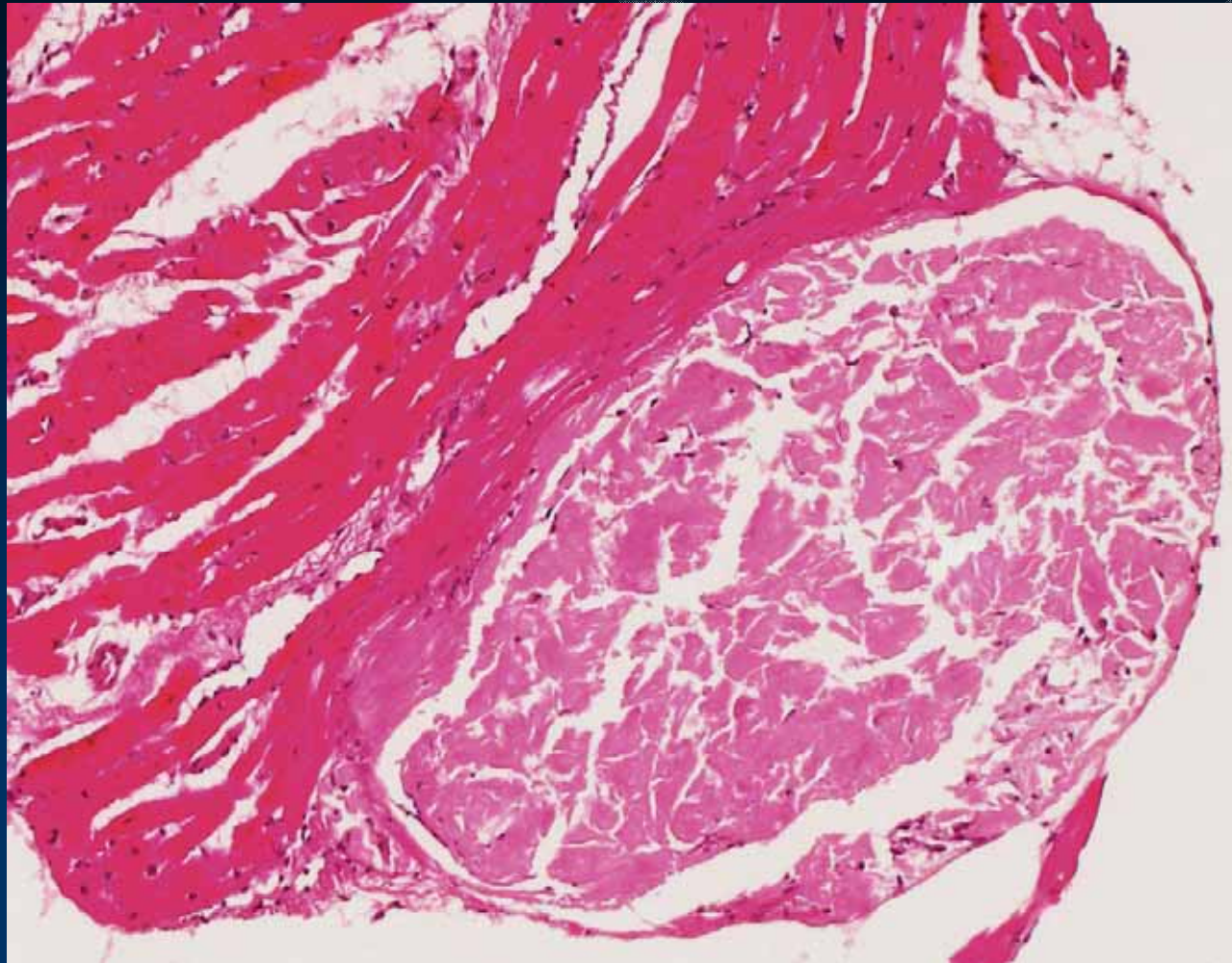
(Peri-) Vascular distribution
E-11833/01 A; HE (10x)



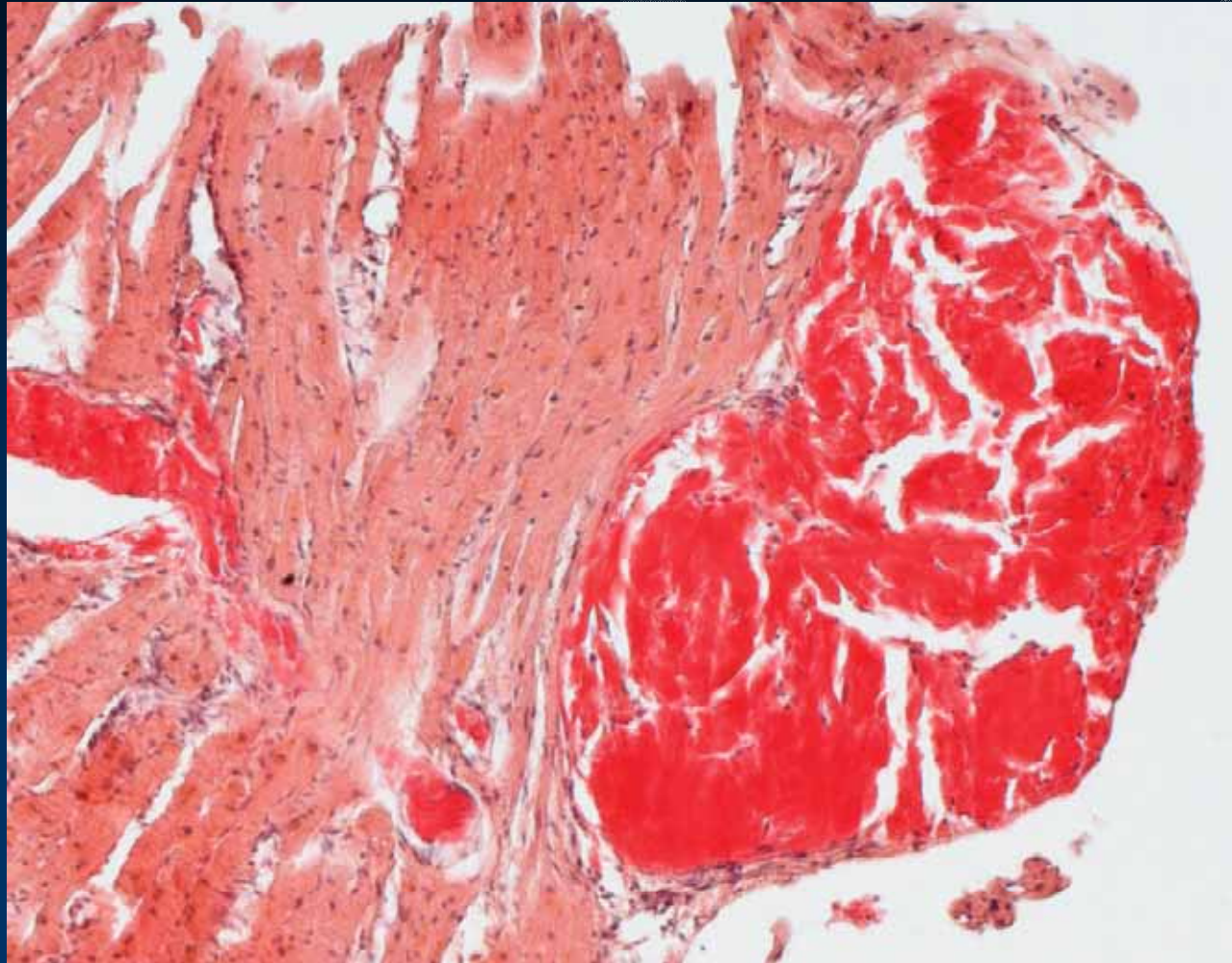
**(Peri-) Vascular distribution
E-11833/01A1; Kongo red (10x)**



(Micro-) Nodular distribution
E-1960/01 A; HE (10x)



(Micro-) Nodular distribution
E-1960/01 A1; Kongo red (10x)



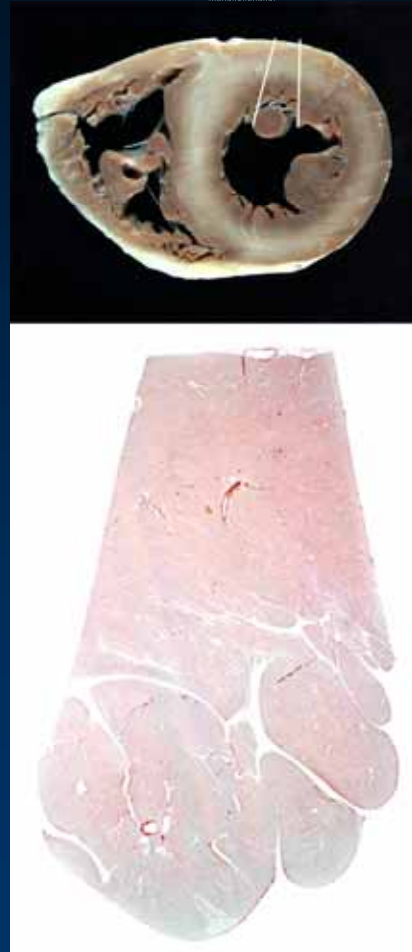
Distribution of amyloid in endomyocardial biopsies

Diffuse endomysial:	24 / 27
(Peri-) / Vascular:	20 / 27
(Sub-) Endocardial:	17 / 27
(Micro-) Nodulär:	11 / 27

Endomysial > Vascular > Endocardial > Nodular

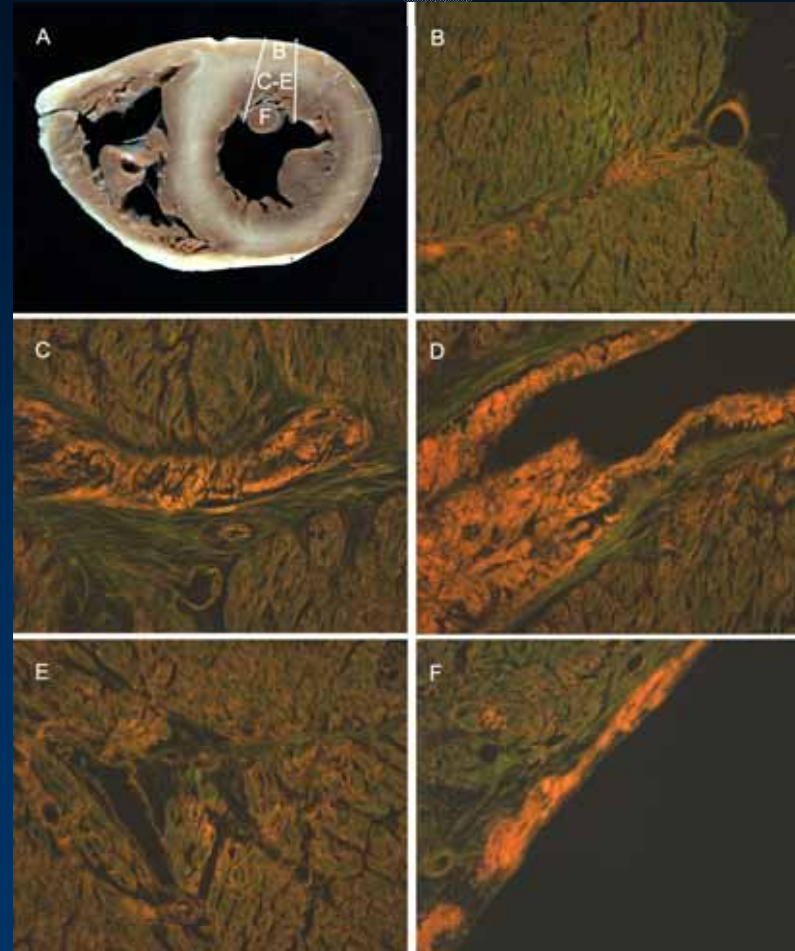
Distribution of amyloid in an explanted heart

E-2434/05: A Macro, B Kongo red



Distribution of amyloid in an explanted heart

E-2434/05: A Macro, B – F Kongo red, B Epimyocardium,
C – E Mural myocardium, F Endomyocardium



Predominant distribution patterns of amyloid in explanted hearts

Diffuse endomysial: 3 / 4

(Peri-) Vascular: 1 / 4

(Sub-) Endocardial: 0 / 4

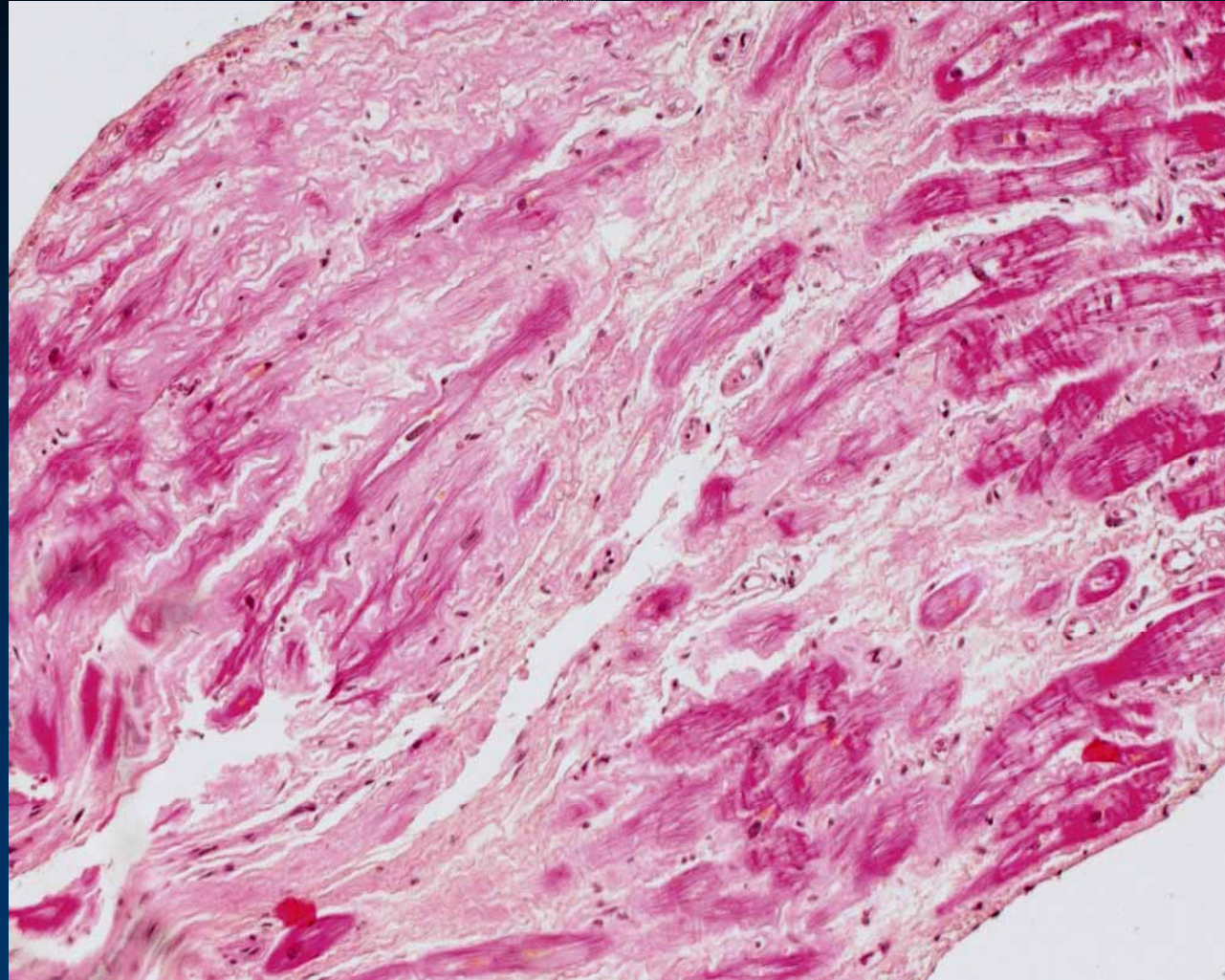
Perimysial: 0 / 4

(Micro-) Nodular: 0 / 4

Endomysial >> Vascular > Endocardial = Perimysial = Nodular

Pathophysiology: Endomysium

E-11674/00 A; HE (10x)



Pathophysiology: Endomysium

E-11833/01A1; Kongo red (10x)



Pathophysiology of amyloid distribution patterns

Diffuse endomysial: Restriction, altered micro-environment & electrophysiology, oxidative stress, (ischemia)

(Peri-) Vascular: Ischemia, fibrosis, altered mechanics

(Sub-) / endocardial: Restriction, (ischemia)

Perimysial: Altered mechanics, restriction, (ischemia)

(Micro-) Nodular: Lokal mechanics, conduction disturbances

Endomysial = Vascular >> Perimysial = Endocardial >> Nodular

Work in progress: Amyloid in endomyocardial biopsies

- Differences between AL und ATTR amyloidosis ?
- Predominant distribution patterns ?
- Correlations with clinical data ?
- Correlations with outcome ?
- Correlation with distribution patterns in explanted hearts ?

Work in progress:

Amyloid in endomyocardial biopsies

Amyloid	Grade	Subendoc.	Endomys.	Perivasc.	Vascular	Micronod.
AL n=30	0	8	3	12	5	17
	1	8	8	2	10	6
	2	10	8	8	5	5
	3	4	11	7	9	2
ATTR n=12	0	2	0	4	7	6
	1	7	2	7	2	2
	2	3	3	0	1	2
	3	0	7	0	1	2

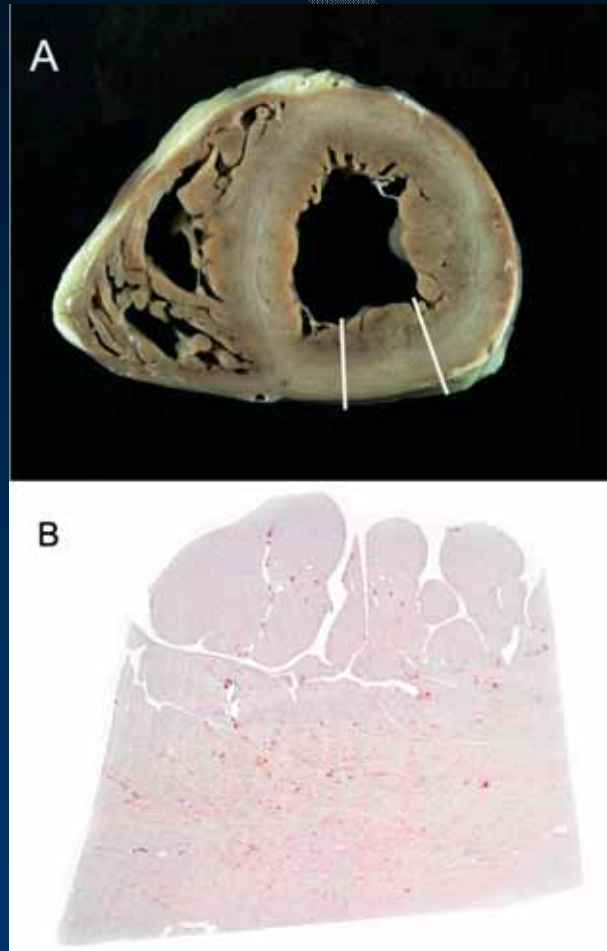
Conclusions

- **To investigate the amyloid distribution in the myocardium, exact and reproducible definitions are necessary.**
- **In explanted hearts we can test how representative biopsy results are and which pathophysiological consequences can be derived.**
- **Correlations between morphological, clinical and radiological results can be found.**

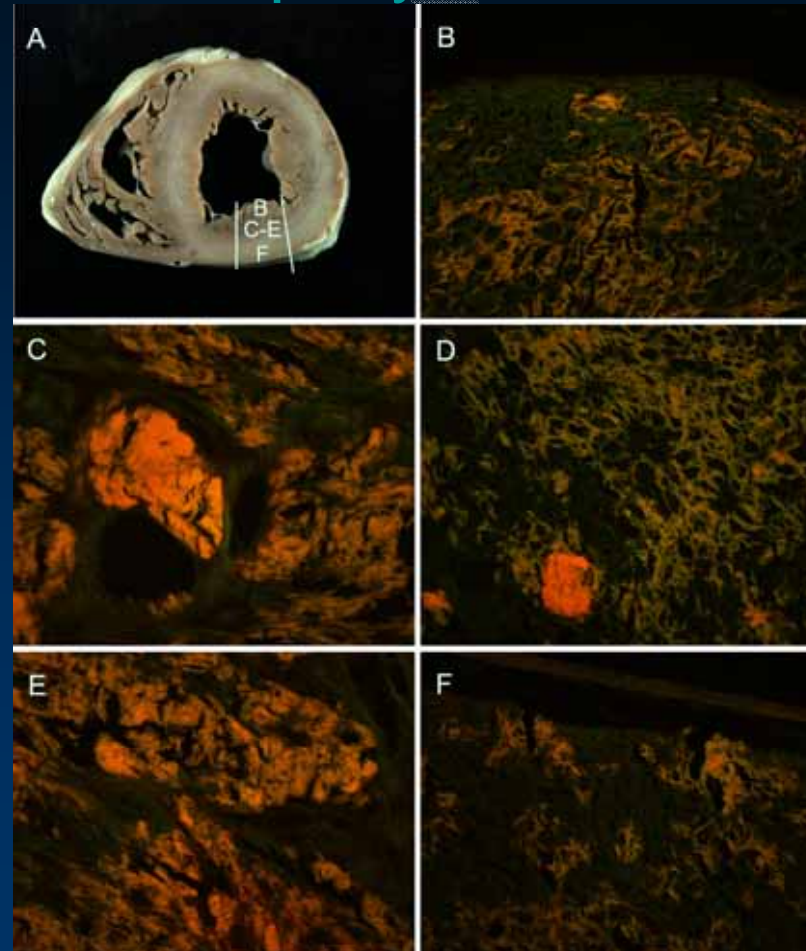
Summary

- **The distribution of amyloid can be evaluated in endomyocardial biopsies (or explanted hearts) as endomysial, (peri-) vascular, subendocardial, (perimysial) and nodular.**
- **The predominant distribution pattern of amyloid can be determined precisely in explanted hearts.**
- **Pathophysiologically the endomysial and the vascular distribution patterns are most significant.**
- **Systematic investigations of the amyloid distribution patterns in relation to functional and prognostic data may contribute to clarify special aspects of the pathophysiology of myocardial amyloidosis and finally the indication for heart transplantation.**

E-2624/05: A Makro, B Kongorot



E-2624/05: A Makro, B – F Kongorot, B
Endomyokard, C – E Murales Myokard, F
Epimyokard



Amyloidverteilung in Explantaten/ bei Autopsie

Diffus interstitiell (endomysial): 4 / 4

Perimysial: 4 / 4

(Peri-) / Vaskulär: 4 / 4

(Sub-) Endokardial: 4 / 4

(Mikro-) Nodulär: 2 / 4

Interstitiell = Vaskulär = Endokardial > Nodulär