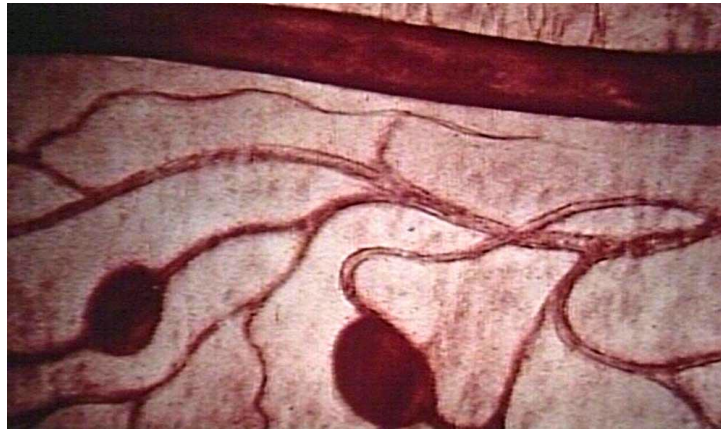


Capillary Microaneurysms in the Human Diabetic Heart

Factor SM, Okun EM, Minase T (1980). *Capillary Microaneurysms in the Human Diabetic Heart*. N Engl J Med 302:384-388

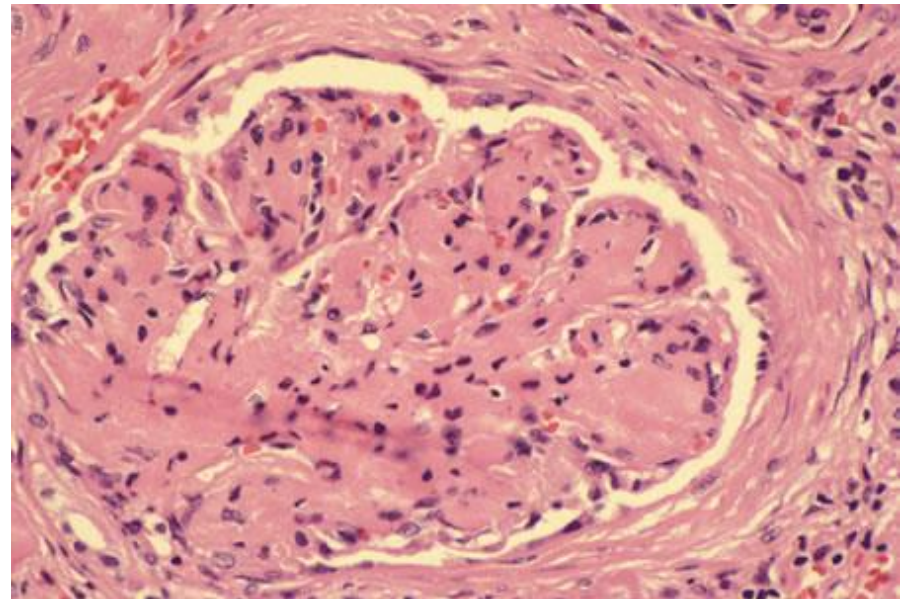
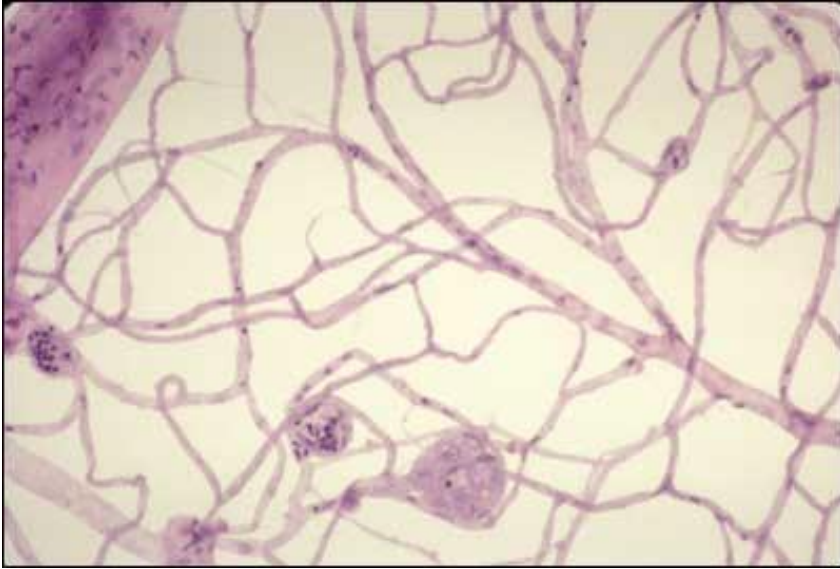


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Microvascular Diseases in DM

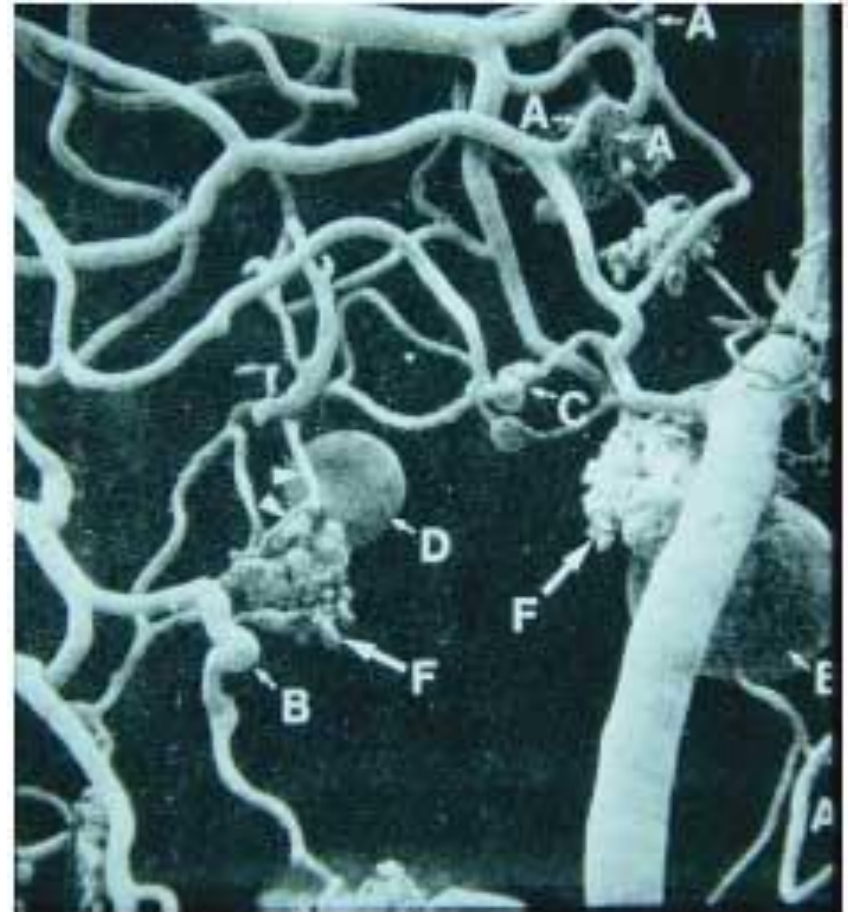
- Increase in width and thickening of precapillary basement membrane
- Microaneurysms of retina and glomerulus

Microaneurysms of retina and glomerulus



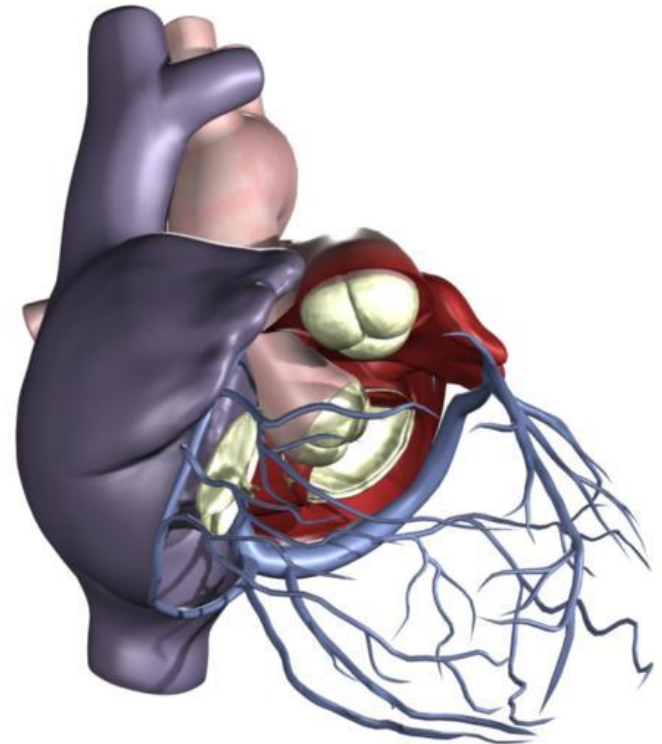
Diabetic Capillary Microaneurysms

- Focal saccular or fusiform expansions of capillaries, arterioles, or venules, that occur along the course of a vessel
- Only described in eye and kidney
 - What about the heart?



Microaneurysms in the Heart

- 14 subjects (8 control, 6 insulin-dependent diabetic patients)
- Vessels perfused with Microfil
- Sections taken for histological study



Heart Microaneurysm Findings

- 3/6 diabetic patients had typical aneurysms, similar to those of retinal vessels
 - Two had occlusive ($>75\%$) CAD, third had juvenile-onset DM with severe nodular glomerulosclerosis and retinopathy
- 0/8 controls had aneurysms
 - Two had occlusive disease of 3 coronary arteries, three had moderate occlusion, three had mild

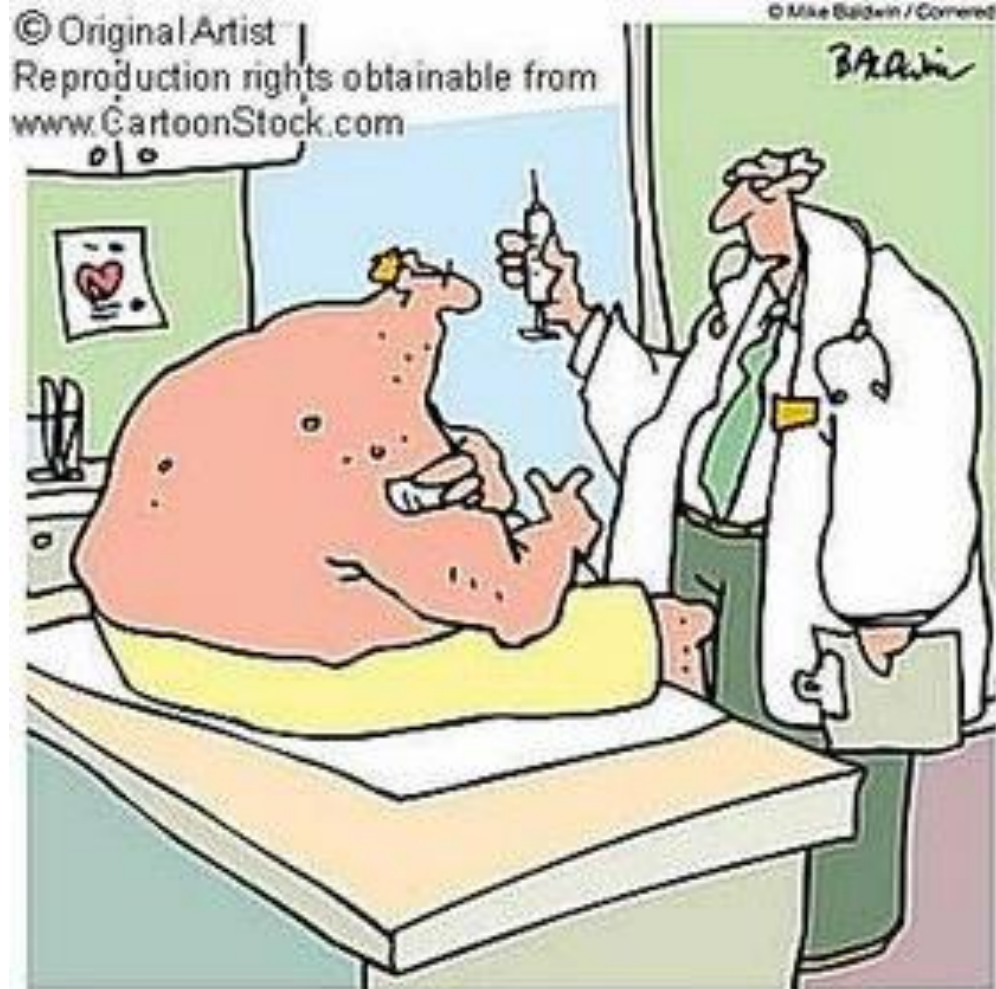
Why have diabetic microneurysms “just” been found in the heart?

- Retinal capillaries are easily viewed in two dimensions, while this new method uses a three dimensional examination
 - Aneurysmal dilation described in the glomerulus, but true saccular microaneurysms have not been seen
- Lack of perfusion studies in solid tissue with material like Microfil

Further Reading

- Ono T, Shimohara Y, Fujiwara K. 1998. Scanning electron microscopic studies on coronary microvascular architecture in diabetic human hearts by corrosion cast. Medical Electron Microscopy. Volume 31, Number 4
- SEM used to study 13 diabetic human hearts and 5 nondiabetic controls
- Microaneurysms were found in 11/13 diabetic hearts, and capillary microaneurysms in all diabetic hearts
- Microaneurysms and capillary microaneurysms not found in non-diabetic hearts

Thank you



"It wasn't really insulin. You don't have diabetes yet. It was just a warning shot."