

Structural-Functional Relationships in Diabetic Nephropathy

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meruli and that these open glomeruli did not manifest marked surface of the renal core and to ensure correct division of the core.

"deposition of basement membrane material" Rader et al performed under the dissecting microscope, to provide glomeruli for

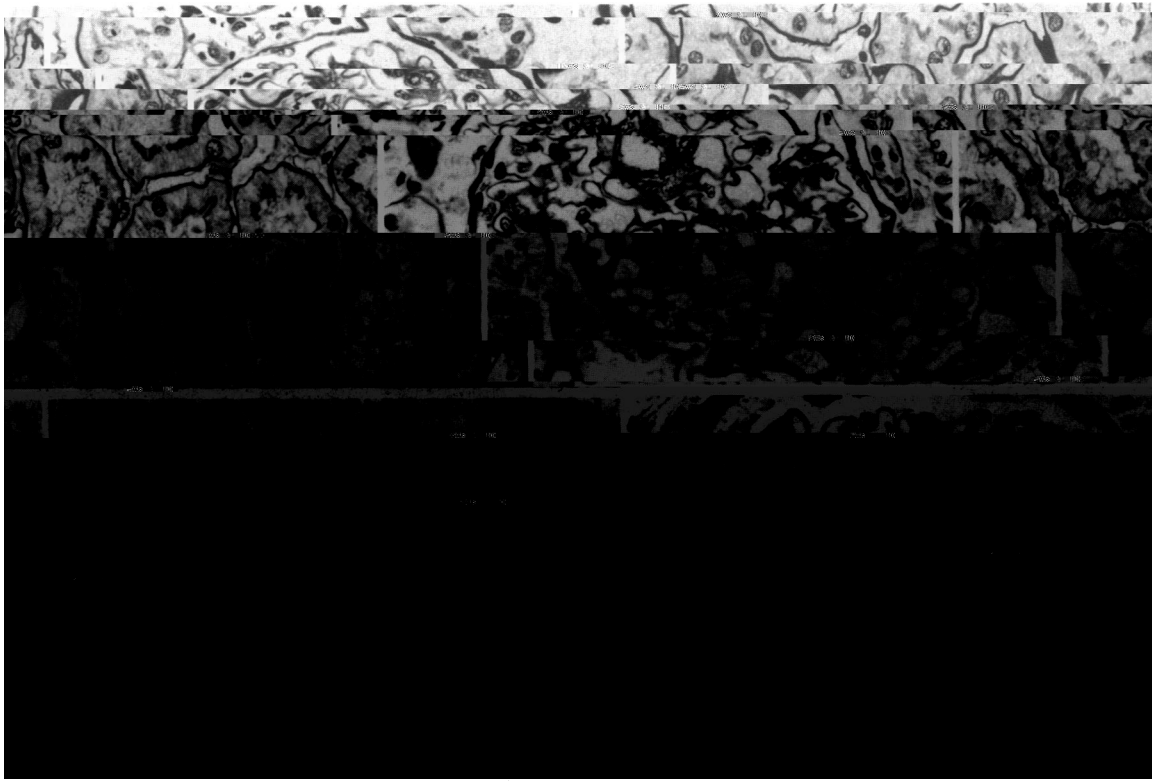


Figure 1. (A) Representative glomerulus from a biopsy with a mean IME of 1.25 (PAS \times 350). (B) Representative cortical area with a mean index of interstitial fibrosis of 0.25 (arrow) in same biopsy as A (PAS \times 350). (C) Representative glomerulus from a biopsy with a mean IME of 3.5 (PAS \times 350). (D) Representative cortical area with a mean index of interstitial fibrosis of 2.75 (arrow) in same biopsy as C (PAS \times 350).

(PAS \times 350). (C) Representative glomerulus from a biopsy with a subtle finding easily overlooked unless specific examination for this measured for each patient because many did not have adequate

parameter is carried out (Fig. 1, B and D). numbers of glomeruli in the biopsy specimens, estimates of absolute The index of arteriolar hyaline sclerosis was determined as a semiquan- volumes of glomerular components and areas of glomerular surfaces

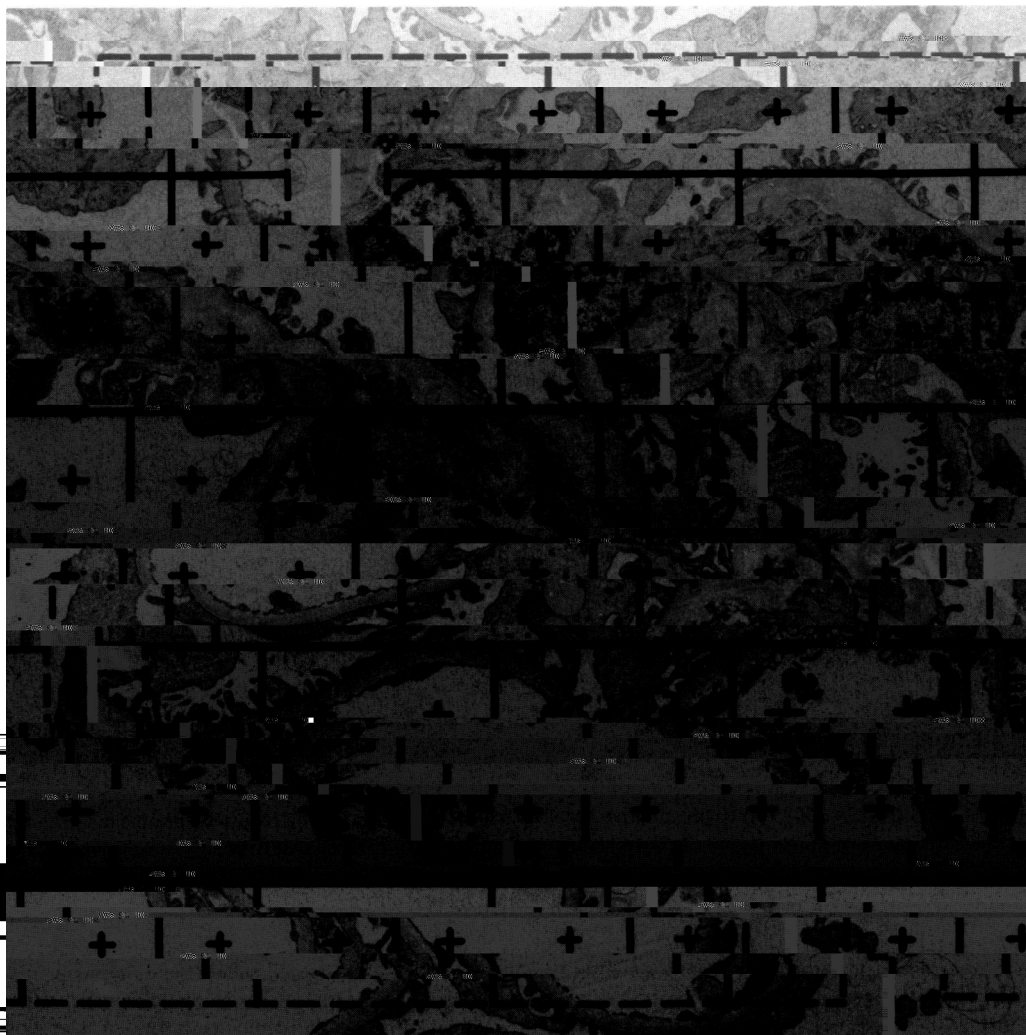


Figure 2. Electron photomicrograph with superimposed grid illustrating lines (solid)

tions with surfaces used to

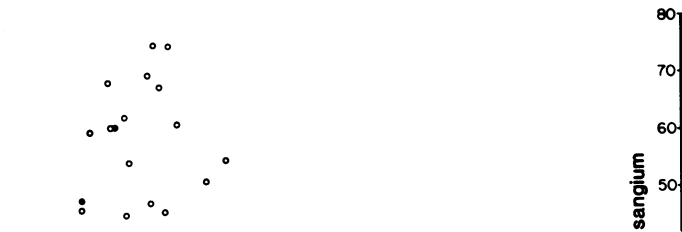
estimate surfaces. Points for

determining fractional vol-



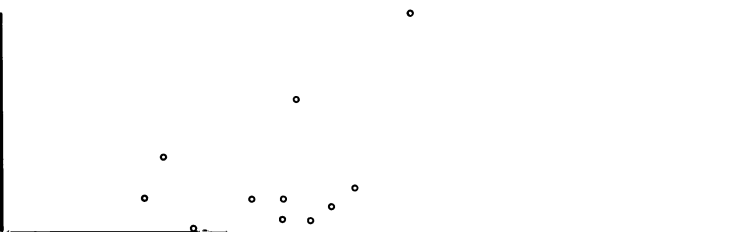
1000
900
800
700
600
500
400
300
200
100
0

is (nm)

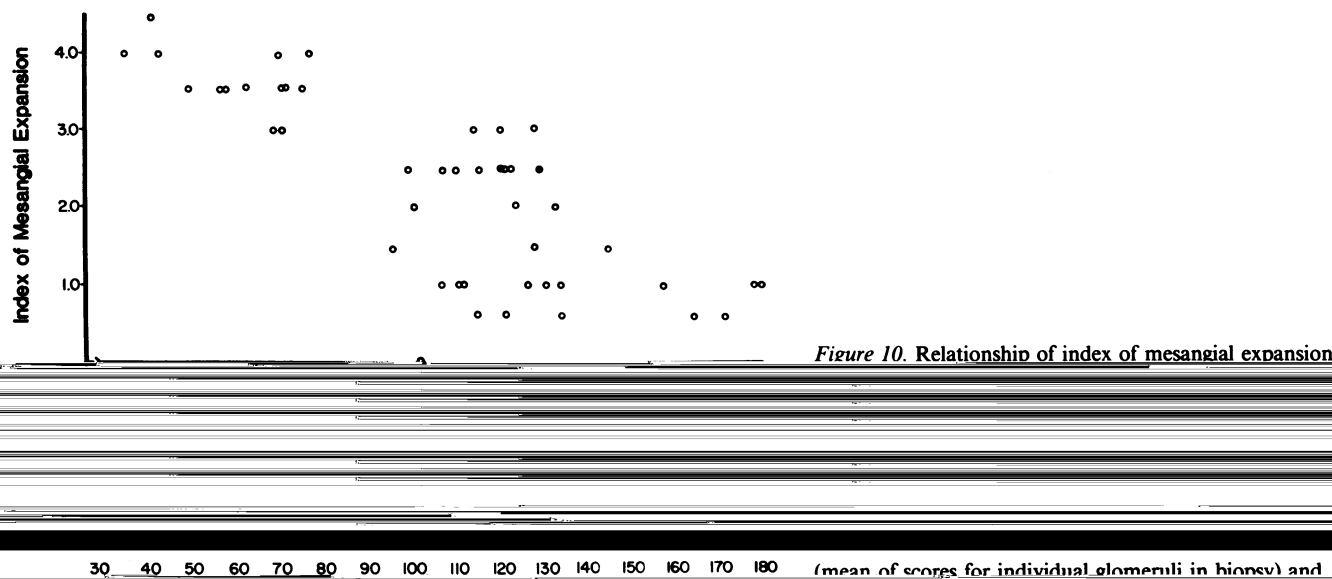


sangium

80
70
60
50
40
30
20
10
0



clear that there can be overlap in the magnitude of the



volume in patients with marked mesangial expansion (>37%).

Discussion

As expected from the method of patient allocation into groups, absolute mesangial volume increased markedly as fractional

Most of the patients studied here had renal biopsies performed

AE

8/24 h

ID^{II}

13.6

IM^I

87.0

92.3

M

M

M

12.5

14.2

19.2

46.8

M

M

92.3

M

M

M

50

M

M

20

12.7

34

ncas

Table II. Relationship of Blood Pressure

and mesangial matrix constituents. Furthermore, unilateral

and Total Mesangial Volume

and Total Mesangial Volume

Table IV. Glomerular Morphometric Parameters Expressed as Absolute Values in Diabetic Patients and Normal Subjects

	Normal subjects	Diabetic patients with total mesangium $\leq 26\%$	Diabetic patients with total mesangium 27–37%	Diabetic patients with total mesangium $> 37\%$
Number of subjects	26	19	12	14
Glomerular volume ($\mu m^3 \times 10^6$)	1.3	1.4	2.4	2.4
Total mesangial volume/glomerulus (μm^3)	0.19	0.26	0.7	1.2
Peripheral capillary filtering surface/ glomerulus (μm^2)	0.17	0.16	0.23	0.12
Endothelial surface mesangial- interface/glomerulus (μm^2)	0.06	0.08	0.16	0.17

values derived from estimates of glomerular volume must be Although glomerular sclerosis cannot, by itself, explain

considered to be preliminary since a direct glomerular volume decreased GFR in diabetic patients with mild to moderate

physical forces result which, independent of the diabetic state, produce progressive glomerular injury. Glomerular sclerosis

Acknowledgments

would aggravate this situation but would not be a necessary

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