Comment on: Hosogai et al. (2007) Adipose Tissue Hypoxia in Obesity and Its Impact on Adipocytokine Dysregulation. *Diabetes* 56:901–911, 2007

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In their most opportune and valuable article (1), Hosogai et al. provide a clear and quite extensive concatenation of data that indicate a very important role for hypoperfusion and hypoxia of adipose tissue in the dysregulated production of adipocytokines and metabolic syndrome. We had previously published a study on the role of adipocyte rupture—the more facile the bigger the adipocyte—in the inflammatory process accompanying visceral obesity (2), and we would like to propose and discuss the hypothesis that the same physical facts may underlie both the rupture of adipocytes (2) and the hypoperfusion/hypoxia described by Hosogai et al. (1): intra-abdominal pressure positively correlates with BMI in all subjects, even in healthy adults (3), but much more so in the morbidly obese, in whom it represents a direct mass effect of the visceral obesity (4). Moreover, intra-abdominal and intrathoracic acute pressure variations, e.g., with cough and physical exercise (3), and even with obstructive sleep apnea (5), put visceral adipose tissue at the highest risk and may explain, in part, the special pathogenicity of visceral obesity.

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Adipogenesis and angiogenesis present close autocrine/paracrine and developmental relationships, appearing as highly coordinated processes (6,7). On the other hand, even very big adipocytes possess only a thin cytoplasm, with all the interior volume of the cell being loaded with stored fat matter. Diffusion of oxygen across that thin cell ring does not seem to be a problem. But the volume of all that fat matter, in large extensions of tissue with only very scarce extracellular matrix, probably easily leads to collapse of adipose capillaries. Increases of intra-abdominal pressure will reinforce that possibility. Against this mass effect, there is hardly any solution other than to reduce the fat.

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