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Change in ectopic fat depots after bariatric surgery is associated with improved metabolic profile

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Objectives: Obesity is associated with change in quantity and quality of fat depots. Bariatric surgery is considered to result in the improvement of obesity related metabolic abnormalities. With the use of computed tomography (CT), we evaluated the change in abdominal fat depots in obese patients after bariatric surgery as compared with that in metabolically healthy patients.

Methods: We analyzed 78 obese patients with metabolic disorders (or abnormalities) and compared them with 78 age-sex matched metabolically healthy control. The volume and radiodensity, as marked by the attenuation of each fat depot, were measured using CT scans. CT was conducted prior to and a year after bariatric surgery. 'Metabolically healthy' was defined as having no hypertension, normal fasting glucose and a waste-to-hip ratio of <1.05 for men and <0.95< for women.

Results: Bariatric surgery reduced the volume and increased the radiodensity of each fat depot. Individuals who achieved a metabolic health status conversion—from unhealthy to healthy—were not only younger but also of lower BMI as compared with individuals without resolution of metabolic abnormalities. Baseline volume of renal sinuses, subcutaneous fats and the extent of the post-surgery reduction of subcutaneous fat volume were associated with metabolic improvement after the surgery. The increase in intraperitoneal fat radiodensity was also associated with the improvement of metabolic abnormalities after the surgery.

Conclusions: Ectopic fat volume such as renal sinus fat and subcutaneous fat and change in subcutaneous volume and intraperitoneal fat density, resulting from weight reduction after bariatric surgery, are associated with metabolic improvement.