Individualized intervention with Metabolic Stem Cell system after bariatric surgery

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(Background) In addition to reducing body weight, ameliorating fat dysfunction by improving hypoadiponectinemia is crucial in protection against the development of metabolic syndrome. We recently started a Weight Management Clinic in order to perform integrated and individualized intervention for obese patients. Here we report 3 cases whose metabolic stem (MSC) cell as adipocyte precursors were obtained during bariatric surgery that can be used as a novel screening system for selecting patient-suitable drugs or supplements to enhance adiponectin secretion. (Method) MSC were prepared from fat tissues collected from 3 patients during bariatric surgery. Case1: 24yo male BMI 52 adiponectin 3.5ug/ml Case2: 24yo female BMI 46 adiponectin 5.3ug/mlCase3: 40yo female BMI 40 adiponectin 1.7ug/mlMSCs were differentiated in cultures into mature adipocytes and treated with drug or supplementation medium every 48 hours. Levels of adiponectin were measured in the culture medium. Dividing the adiponectin secretion on day 12 by that on day 10 provided an estimate of adiponectin-producing activity in culture. (Result) Using this score, we assessed 80 candidate agents in a 96-well plate. Moreover, we identified some novel adiponectin up-regulatory effects for several substances, including Turmeric and Ryukyu herb. Even after weight reduction achieved by surgery, additional enhancement of adiponectin was observed in all cases with suitable supplementation. (Case1: adiponectin 7.4 ug/ml, Case2: adiponectin 10.1 ug/ml, Case3: adiponectin 2.1ug/ml)(Conclusion) MSC system is able to identify potential responders to specific agents. This can be applied to post-operative individualized intervention for morbid obese patients.