**Supplementary Fig. S1** Thrombin-induced platelet aggregation in obese patients after weight loss in sub-group and total study populations. Washed platelets were stimulated with 30 or 200 mIU/mL thrombin and recorded for aggregation for 4 minutes. Thrombin concentration required to induce 50% of maximum platelet aggregation (EC50) were normalized to EC50 obtained with platelets from matched lean controls. Left: results obtained with the 17 patients with complete platelet experiments (Fig. 1C, right); right: results in all available patients ($n = 27$).

**Supplementary Fig. S2** Obesity is associated with decreased Ca$^{2+}$ thrombin–induced mobilization, that is normalized after weight loss. (A). Value of Ca$^{2+}$ mobilization (area under the curve (AUC) for 2 minutes) assessed as in Fig. 3B with all available pairs of patient and matched control of the study at inclusion and after weight loss. $n = 27$; ***$p < 1.10^{-3}$; Unpaired t-test between inclusion and follow-up. (B). Histogram displaying mean of Ca$^{2+}$ mobilization observed for the 17 patients in the study compared to all available pairs of patient and matched control of the study at inclusion and at follow-up ($n = 27$ pairs).

**Supplementary Fig. S3** Obesity is associated with unchanged Ca$^{2+}$ influx after thrombin induced mobilization. Three minutes after thrombin stimulation in Ca$^{2+}$-free medium, extracellular Ca$^{2+}$ (300 µM) was added to the cells. Ca$^{2+}$ influx measurement (AUC for 2 minutes) of all available pairs of lean controls and obese patients, at inclusion and after weight loss in obese patients ($n = 27$) are presented as the percentage of the value obtained for the matched control.
Supplementary Fig. S4 SERCA3–dependent Ca\(^{2+}\) store content was depleted using SERCA3 inhibitor tBHQ (10 µM) and calcium increase in cytosol was measured by flow cytometry using the cytosolic Ca\(^{2+}\) fluorescent probe Oregon-Green-BAPTA-AM. Ca\(^{2+}\) leak due to SERCA3 inhibition in platelets from lean controls and obese patients at inclusion and after weight loss in obese patients are presented as the percentage of the value obtained for the matched control. \(n = 17; \ ***p < 0.001; \) (paired \(t\)-test).

Supplementary Fig. S5 Obesity is associated with low expression of platelet SERCA3a and SERCA3b but not SERCA2b. Platelet lysates in lean controls and obese patients at inclusion were analysed for SERCA3a, SERCA3b and SERCA2b expression using isoform specific antibodies. Calreticulin (CRT) expression was used to assess protein levels.