This study evaluated the effect of retroperitoneal adipose tissue on testicular venous drainage and tested the nutcracker phenomenon by clinical and imaging findings. A total of 95 patients were included. The patients were evaluated with a detailed medical history and physical examination for varicocele. Their weight, height and waist circumference were also recorded. Body mass index was calculated as weight (kg)/height squared (m^2). Pampiniform plexus diameters were measured by scrotal colour Doppler ultrasonography, and retroperitoneal adipose tissue was evaluated by noncontrast abdominal computed tomography. We determined an almost significant correlation between BMI and varicocele presence by physical examination (P = 0.06). However, there was a significant relationship between WC and varicocele identified by physical examination (P = 0.021). There was a positive and significant relationship between BMI and pampiniform plexus diameters. Furthermore, we detected a negative correlation between retroperitoneal adipose tissue measurements and CDU findings. Additionally, there was a significant correlation between WC, pampiniform plexus diameters and CT findings. It is concluded that increasing BMI and increasing WC may play a protective role in the development of varicocele. There is a need for further studies to verify the effect of obesity on varicocele formation.