In this paper, in order to enlarge its torque density, an overlapping winding (OW) is applied to the 24/16-stator/rotor-pole flux-switching permanent magnet (FSPM) machine. By adopting an OW-configuration with full-pitch coils, the pitch factor and coil-flux cross-sectional area in the 24/16-pole FSPM machine with nonoverlapping winding (NOW) can be doubled. Thus, the fundamental open-circuit phase flux-linkage and back-EMF can be effectively enhanced by 115.28%, making it comparable to the conventional 12/10-pole NOW-FSPM machine. Therefore, by injecting the same current density, the proposed OW-FSPM machine can produce 65.2% higher torque density than its NOW counterpart, and 17.6% higher torque density than the conventional 12/10-pole NOW machine despite 21.5% lower ampere turns due to a smaller slot area. However, the proposed machine suffers from high torque ripple due to high cogging torque and back-EMF harmonics. Torque ripple reduction by harmonics current injection and rotor skewing in the proposed machine are investigated. Results show that both methods can effectively reduce the torque ripple in the proposed 24/16-pole NOW-FSPM machine, albeit with the level of torque density being compromised. Experiments are performed in order to validate the analysis.