We propose a new percutaneous release technique for carpal tunnel syndrome under the guidance of ultrasonographical monitoring. This technique provides direct visualization of the target structures, guides the division of the transverse carpal ligament by a simple hook knife, and avoids the risks of incomplete release and injury to adjacent neurovascular structures. The transverse and longitudinal "safe zones" localization, estimated size, and extent of the transverse carpal ligament were determined using a cadaver study. We will describe this new operative technique performed under local anesthesia without tourniquet and the clinical outcome. We will first, report our first prospective clinical study of 91 consecutive cases of carpal tunnel release treated with this technique up for 22.5 months. The sensory disturbances disappeared in 76.8, 93.4, 100, and 100% of the patients in 1 week and 2, 6, and 12 months postoperatively, and 24.2% experienced moderate pain within 1 week, 6.6% within 2 months, and 1.1% within 12 months after the operation. Second, the author's experience with total of 4841 procedures in 3,247 patients performed during a nine-year period will be present too. Follow-up evaluation was performed in 4,794 (99.0%) hands or 3205 (98.7%) patients. A total of 92 hands (1.9%) were considered had unsatisfactory results; including 42 hands complained moderate wrist pain persisted over 6 months and 50 hands complained of persisted/recurrent numbness. There were no permanent nerve injuries. The ultrasonographical guidance can be used to avoid injury to neurovascular structure and release the carpal tunnel effectively in the management of carpal tunnel syndrome. The ultrasonographical guidance can be used to avoid injury to neurovascular structure and release the carpal tunnel effectively in the management of carpal tunnel syndrome with meticulous surgical technique. In summary, this technique might be a useful alternative to open carpal tunnel release or endoscopic carpal tunnel release because of its simplicity, effectiveness, lower cost.