This study was conducted to evaluate the clinical use of the percutaneous intramuscular electrode in functional electrical stimulation (FES). The indwelling electrode was composed of helically coiled Teflon-coated rope stranded from 19 hard drawn wires of SUS 316L stainless steel (SES114, NEC Co. Ltd., Japan). Seventeen patients (12 males and 7 females) who had implanted percutaneous intramuscular electrodes for more than one year were examined. The average follow-up time after implantation of electrodes was 2.2 years (range, 1 year to 4 years 10 months). Overall, there were 327 electrodes (83 upper extremities and 244 lower extremities). The rates of breakage, movement, infection, and the number of electrodes that needed reimplantation were evaluated. Only one electrode broke (0.3%) in the iliopsoas muscle at 12 weeks after implantation. Eight electrodes (2.4%) were removed due to loss of sufficient contraction force caused by movement of the electrodes. Movements occurred at 9 weeks in 6 electrodes and at 5 months in two. The failure rate of electrodes in the lower extremities was 3.7%. No failures occurred in the upper extremities. Ten electrodes (3.1%) required reimplantation. Although ten superficial infections (3.1%) were seen around the site of electrode insertion, no removals of electrode were needed. However, all electrodes in one patient were removed because of generalized MRSA infection complicated with renal disease. Electrodes were reimplanted after improvement of the infection. The ultrafine percutaneous intramuscular electrode was considered practical for long-term FES use.