MECHANORECEPTORS IN THE SACROILIAC JOINT

INTRODUCTION
The sacroiliac joint is considered to be a source of low-back pain. Many clinical studies for the diagnosis of sacroiliac joint pain have reported, but there have been no satisfactory diagnostic method without injection and blocks. Do the sacroiliac joints really transmit pain to the central nervous system? The sensory innervation of the sacroiliac joint has not been fully characterized with neurophysiologically. The purpose of this study was to characterize the somatosensory afferent units in the sacroiliac joint of the cat and to determine whether, electrophysiologically, these units have a nociceptive function in the sacroiliac joint.

MATERIALS & METHODS
Experiments were carried out on 10 adult cats weighing 3-4 kg. The animals were anesthetized with sodium pentobarbital i.v. An L4-S1 laminectomy was performed, and the L4-L6 dorsal roots were cut at their proximal ends, split, and draped over a bipolar recording electrode. Glass probes were used to search the sacroiliac joint and adjacent tissues for mechanosensitive units (Fig. 1). When units were identified, they were stimulated electrically to obtain conduction velocities and Semmes-Weinstein Monofilaments in order to determine mechanical thresholds (Fig. 2).

RESULTS
Twenty-nine discrete mechanosensitive units were identified in the sacroiliac joint and adjacent muscles. Of these 29 units, 26 units were found in the posterior sacroiliac ligament and the other three in the adjacent muscles. Sixteen units (55%) were identified in the rostral third of the sacroiliac joint. Conduction velocities of the units ranged from 3.10 to 22.00 m/sec (average, 9.16 m/sec). Twenty-six units belonged to group III (Fig. 3). Mechanical thresholds of the units ranged from 4.64 to 164.32 g (average, 69.67 g). Twenty-eight units (96.55%) had thresholds of > 7.0g and one unit (3.44%) had a threshold of < 7.0g.

DISCUSSION
Group-III units with mechanical thresholds of > 7.0g may serve as nociceptors, and units with thresholds of < 7.0g may serve as proprioceptors. The present study showed that most of the units in the sacroiliac joint were high-threshold group-III units, which may have a nociceptive function. This result suggested that the sacroiliac joint may be a source of low-back pain. This result also indicated that there are only a few proprioceptors in the sacroiliac joint. Our previous studies showed that the average mechanical thresholds were 7g in the lumbar facet joint units and 241g in the lumbar intervertebral disc units. The results of this study suggested that the sacroiliac joint had intermediate responsiveness to noxious stimuli between the facet joint and the intervertebral disc.

CONCLUSION
Mechanosensitive units in the sacroiliac joint were identified. Most of the units were nociceptive units, suggesting that the sacroiliac joint is a source of low-back pain.