Optimization of high-frequency electrosurgery of the meniscus.

Abstract:
In an in vitro study of the sheep's meniscus, the possibilities to reduce the thermal tissue necrosis caused by high-frequency electrosurgery of the meniscus were studied. Under standardized conditions, machine-made sections through the meniscus were cut using electrodes of various thicknesses and different settings of the electric generator. The thermal tissue necrosis near the cut through the meniscus was determined using light microscopy and image analysis on the specimen stained according to Masson-Goldner. With a constant voltage of 250 V tissue necrosis was significantly less for electrodes of a diameter of 0.5 mm than for 1.5-mm electrodes (187.3 microns as compared with 368.0 microns). For electrosections carried out using a commercially available electrode with a low voltage of 250 V as well as with a power-controlled generator, tissue necrosis was also significantly less than with a constant high voltage of 395 V (181.4 microns and 210.2 microns as compared with 325.0 microns). Thus, an effective reduction of thermal tissue necrosis in arthroscopic partial meniscectomy is possible when thin electrodes and power-controlled generators are used.