Background

In previous studies, changes in the surface of the peritoneum during laparoscopic surgery are well defined. Nevertheless, almost all of these studies were performed on rodents via scanning electron microscopy. In the present study, structural alterations of the mesothelial cells of peritoneum were examined during laparoscopic cholecystectomy using transmission electron microscopy.

Methods

Twenty patients with symptomatic cholelithiasis were included in the study. Peritoneal biopsy was performed immediately after CO₂ pneumoperitoneum creation and at the end of surgery just before gallbladder removal. Biopsies were taken from the right upper quadrant, i.e., apart from operative manipulation. Peritoneal sample cross-sections were compared using transmission electron microscopy.

Results

The carbon dioxide pneumoperitoneum during laparoscopic cholecystectomy caused deteriorations of the peritoneal mesothelium. Apoptosis were developed in mesothelial cells. Bulging of mesothelial cells, irregular cell junctions, focal intercellular clefts, apical cell membrane degeneration, deep nuclear invaginations, and lipid droplets in the cytoplasm of the mesothelial cells were other remarkable findings. Mesothelial edema also was determined.

Discussion

As seen in previous studies, basement membrane nudity appeared after carbon dioxide pneumoperitoneum could be attributable to mesothelial cell apoptosis, deterioration of the cell structure, and cell organelles.