Angiogenic effects of epidermal growth factor (EGF), a potent mitogen, have been demonstrated previously. Moreover, different in vitro studies showed that EGF affects processes associated with bone healing, such as osteoblast differentiation and bone resorption. The aim of this study was to investigate the effect of combined core decompression (CD) and recombinant human EGF (rhEGF) treatment on early-stage osteonecrosis of the femoral head (ONFH) surgically induced in rats. ONFH was induced by dissecting the cervical periosteum and placing a ligature tightly around the femoral neck. Thirty rats were assigned to one of the following groups (n = 10 each group): sham-operated control, CD, and CD+rhEGF group. rhEGF was injected intraosseously into infarcted areas 2 weeks after the surgery. Preservation of femoral head architecture was assessed at 8 weeks post treatment by radiographic and histomorphological analyses. Osteopontin (OPN) and cluster of differentiation 31 (CD31) were detected by immunochemistry, as indicators of bone remodeling and vascular density, respectively. Inter- and intra-group (non-operated left and operated right femur) differences in radiographic and histomorphological results were analyzed. The femoral head area and sphericity were more preserved in CD+rhEGF compared to CD and sham-control group. CD31 levels were significantly different between the three groups, and were higher in CD+rhEGF compared to CD group. OPN levels were increased in CD and CD+rhEGF groups compared to sham control, but with no significant difference between CD and CD+rhEGF groups. Overall, our results indicate that EGF promotes bone formation and microvascularization in ONFH and thus positively affects the preservation of femoral head during healing.