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Effects of hyperbaric oxygen therapy on perfusion parameters and transcutaneous oxygen measurements in patients with intramedullary nailed tibial shaft fractures.

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We evaluated the effect of hyperbaric oxygen (HBO<sub>2</sub>) therapy on tibialis posterior (TPA), dorsalis pedis (DPA), and sum (TPA + DPA) arterial peak signals, as well as transcutaneous oxygen (PtcO<sub>2</sub>) tension and leg skin temperature (T) after intramedullary nailing of tibial shaft fractures. Twenty consecutive patients with closed and simple tibial shaft fractures treated with reamed intramedullary nailing were assigned randomly to HBO<sub>2</sub> or control groups. HBO<sub>2</sub> therapy was given postoperatively at 2.5 atm abs pressure for 90 min daily for a total of five treatments. The first HBO<sub>2</sub> therapy was given 1 h after the operation. In both groups, measurements were performed preoperatively, 30 min and 6 h postoperatively, and on the following 5 days. There was a statistically significant improvement in TPA values in the nailed legs in the HBO<sub>2</sub> treatment group after the first postoperative day, and these values remained at a significantly higher level until the end of the study when compared to the nailed legs in the control group. Further, there was a statistically significant improvement in PtcO<sub>2</sub> values in the nailed legs in the HBO<sub>2</sub> group after the third HBO<sub>2</sub> treatment. However, there were no statistically significant differences in DPA and TPA + DPA values within or between the nailed legs in HBO<sub>2</sub> and control groups. HBO<sub>2</sub> therapy seemed to decrease the skin temperature of the nailed legs, but this alteration was not statistically significant. In addition to the clearly documented advantages in the management of crush injuries and compartment syndromes, HBO<sub>2</sub> therapy has a positive effect on the perfusion parameter (TPA) and PtcO<sub>2</sub> in patients with low energy, intramedullary nailed simple tibial shaft fractures. The improvement in TPA and PtcO<sub>2</sub> values may result from the vasoconstrictive and edema reductive effect on HBO<sub>2</sub> with concomitant inhibition of inflammatory reactions with slight cooling.